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“MILITARISTIC JAPAN”

By GEORGE BRONSON REA

JAPAN AND CHINA JOIN HANDS

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"Militaristic Japan"

A Whiff of Realism

By GEORGE BRONSON REA

SPEAKING before the graduating class at the Pennsylvania Military College on June 10, Secretary of State Cordell Hull deplored the glorification of military power as an achievement and warned against the military assuming direction of foreign policy. "This recrudescence of the military spirit," he said, "is all too prevalent in the world to-day and it is incumbent on nations recognizing this menace to the atmosphere of economic stability, peace and international sanity, to turn the spotlight of publicity on those who are guilty and reiterate with all their power that excess of armaments can only lead to disaster." In conclusion, he pledged the efforts of the United States to preserve peace and restated the adherence of his government to the Kellogg-Briand Pact as the basis of American foreign policy.

Five weeks later, War Minister General Hayashi was telling the people of Japan that armaments must take precedence in compiling the budget. The head of the Japanese army expressed himself as being pessimistic over the international outlook and far from being satisfied that diplomacy, peace pacts and limitations of armaments will safeguard adequately the national security. The changes in the Far Eastern situation have made Japan's position increasingly serious. Developments in armaments have been at such a rapid rate that the Japanese army with its present equipment lacks confidence in its ability to defend the nation. It insists that larger appropriations are unavoidable. The diametrically opposed viewpoints of the American statesman and Japanese army chief typify the general attitude of their respective nations toward a world situation pregnant with explosive possibilities. Secretary Hull discloses that his government is adhering to the Stimsonian doctrine of marshalling world opinion against those nations which resort to force, without regard apparently for the provocation or circumstances which make such action obligatory.

Japan's decisive stand in Manchuria, Germany's denunciation of the armament clauses of the Versailles Treaty, and Italy's war preparations against Abyssinia, tell us that peoples whose national life and ambitions are circumscribed will not

permanently accept an inferior status without a struggle. Those nations which have gained their present supremacy by the weight of their armies will not be permitted to conserve the waste spaces of the world in trust for their own future surplus population against the clamorous demand and surge of new-born millions in other lands seeking escape from economic servitude. Unless the conquerors of yesterday retain the spirit and the will to fight and to hold what they possess, they will be swept aside and overwhelmed by the crushing weight of mounting millions to whom treaties, that deprive and deny to them the right to expand, will never be binding or sacred. The world will not remain static.

The Basic Problem

It is an axiom of international law that no people, nation or community can by treaty bind itself into slavery and it is becoming increasingly evident that this basic principle of right and justice will be invoked to include economic restrictions, armament limitations, and other impairments of national life hitherto accepted as

sacred and binding on future generations when written into permanent treaties. The ages-old struggle for life, for equal opportunity, for a place in the sun, will continue unabated. The League Covenant, Universal Peace Pact, Naval, Air and Armament Limitation Agreements and all the ponderous machinery erected to preserve the supremacy of the great powers, have contributed little or nothing to solve the basic problems of mankind or eradicate the causes which lead to war. The Truce of Versailles merely intensified the struggle. The World War is still being waged in all its ferocity, but with weapons more deadly, more inhuman, more destructive to human life and happiness than the bullets, bayonets and bombs of fifteen years ago. Money, exchange, tariffs, quotas, subsidies, boycotts, economic sanctions, immigration and exclusion acts and all the complicated substitutes for war have contributed to the destruction of more wealth and brought about more human misery than the ravages of old-fashioned strife.



The Peaceful Premier of Japan Admiral Kessuke Okada

Not even Roosevelt on a fishing vacation or Baldwin on the golf links could look so care-free, cheerful and satisfied as this jolly old sea-dog and fighting admiral who directs the destinies of Nippon.

The sooner the American people awaken to these truths and prepare to uphold their ideals of peace by something more formidable than unrelenting publicity against peoples seeking escape from their misfortunes, the better will be their chances of surviving in the struggle for mere existence that is now confronting the civilized world.

The Stimsonian method of fulminating against those who resort to arms in defence of their strategic or economic security, subscribed to by his successor in office, is so akin to the traditional Chinese custom of "reviling the street" that it should not be permitted to become grafted on to old-fashioned, straightforward American diplomacy. If the Kellogg-Briand Pact is the supreme law, it becomes obvious that the nation whose spokesmen can talk the loudest, the longest and most convincingly, should be awarded the victory in an international oratorical contest. As long as minor issues are at stake, such a method of settling disputes has its merits, but no sovereign state of to-day would consent to place in jeopardy its independence and right of self-defence by submission to a decision reached by such means. Sanctions or force must support the verdict.

An Old Chinese Custom

To persist in turning the spotlight of publicity on another nation, calling it names, swearing at it and telling the world what we think about it, is merely adhering to a very old Chinese custom. The crowd soon tires of the entertainment and disperses jeering and ridiculing the reviler. The Chinafication of our diplomacy, if persisted in, will land us in the same plight as "our great sister republic" finds itself to-day, a country peopled with millions of sturdy pacifists inculcated with the doctrine of non-resistance and passive acceptance of fate, who have lost the spirit and the will to fight but whose volubility, matchless command of invective, vituperation, villification and skill in debate, transform them into formidable and dangerous adversaries in an open forum. The United States is headed in the same direction.

* * *

It was not difficult to marshal world opinion against Japan when self-interest, racial prejudice and fear swayed the decision against her. The same procedure could not be applied to Germany. Italy will tolerate no interference with her plans. A new generation has grown to manhood in Germany. For years, Mussolini has been calling upon the women of Italy to give him sons. To-day, he can place a million men in the field. The Soviet Government is boosting the birth-rate. Last year saw an increase of 4,500,000 in the communist state. In ten years, 50,000,000 more Slavs will seek their outlet on the plains of Central Asia. The youth of Europe is arming, drilling, preparing feverishly against the day when it will write a new and glorious page in the history of its fatherlands. Under the emblems of the swastika, the hammer and sickle, and the mother-wolf of Rome, preparations for war are being openly pushed forward. The spotlight of publicity cannot turn these peoples from their objectives. Guilty though they may be of violating the spirit of the peace pacts, in their hearts they are convinced of the righteousness of their cause and will fight for their conception of equality and the right to exist,

Under these conditions, who will be bold enough to sit in judgment and dictate what constitutes excess armaments? Is the limit to be determined by the more powerful states and quotas assigned that will maintain the others permanently in an inferior and unequal position? Is not this demand for equality in armaments the underlying cause of most of the unrest in the world to-day, the cry of new-born millions of human beings for their right to live in moderate security and comfort? Does not all the talk of war emanate from peoples determined to break the bonds which hold them in an inferior economic status? As long as these inequalities of opportunity and privilege exist, no high-spirited people will submit to an imposed limitation of armaments which condemns them ultimately to practise birth-control, race suicide and to slow but certain death. Until there is a redistribution of the waste spaces of the world it seems futile to denounce governments and military leaders, who, in the last analysis, are merely representative of the whole, retaining their place, power and hold over the people by advocating, applying and enforcing policies devised to alleviate their condition.

* * *

The time inevitably arrives in the history of all nations when the fighting services will dictate the basic policy of their governments, just as the Admiralty in Great Britain and the General Staff in France lays down the irreducible minimum for national defence. On this firm guarantee of security, the diplomats are permitted to have more or less their own way in the conduct of foreign affairs. The time will also arrive in the United States when the General Staffs of the Army and Navy will assert their right to be consulted in the formulation of policies they are expected to uphold and enforce. If one department of government should persist in promulgating doctrines for regulating world affairs, if it should then exact a rigid adherence to its own interpretation of treaties, if it should protest and write notes condemning the "wrong-doer," the force must be behind it to command respect for its viewpoint. If that force is lacking the nation is liable to be humiliated. More than that. It may be forced into hostilities and invite defeat and disaster through unpreparedness.

The United States has been singularly fortunate in its past wars, but Americans can no longer rely on Providence or pin their hopes of victory on miracles. The lessons of the past have seemingly taught us little. We have always plunged into war unprepared to fight, sacrificing

the young manhood of the nation to the greed of politicians who diverted funds that should have been voted for national defence into channels for the benefit of their own districts and constituencies. The young men of America have never had a fighting chance. Our governments have sent them to the slaughter on a sudden hurricane of anger, sentiment or hysteria, incited by downright falsehood, gross misrepresentation of facts, invective, villification, prejudice and appeals to high moral and humanitarian principles, invoked to conceal our real aims.

A Factor Overlooked

The American people are impressionable and easily swayed by those in authority. But they have learned their lesson. It is



His Excellency Kiki Hirota

In the Foreign Office of Nippon, directing its diplomacy, sits a man, comparatively young in years who retains his faith in the peaceful solution of Japan's difficulties. With a firm grasp on international affairs, a keen understanding of Western psychology and ability to express himself in English, he has not been influenced by Western ideals. He remains a typical Nipponese, imbued with the highest traditions of his race. Given the time to carry out his policies, there need be no misgivings about the future of peace in the Pacific and Eastern Asia.

safe to state that never again will our untrained youth march gaily forth to battle keeping step to the blaring strains of martial music improvised by stellar comedians and cheered on by crowds shouting meaningless but soul-inspiring slogans coined by dollar-a-year publicity experts.

If those in charge of our foreign relations persist in raising issues that may lead to war without reference to the preparedness of the fighting services to support their viewpoint, the nation must not be surprised if those responsible for its security assume direction of its foreign policies and diplomacy. If we expect the young manhood of America to perform its duty in an emergency it must be trained beforehand and provided with the arms and the modern mechanical devices to fight with. If the necessary appropriations for adequate preparedness and defence are withheld, while pacifist politicians, church organizations, League enthusiasts, international plotters and disarmament cranks hold conventions and pass resolutions for influencing our foreign policies, the day will inevitably arrive when the fighting services in sheer self-defence will assume direction of our destinies as the only insurance against disaster.

There is a limit to pacifism. We may preach it, practise it, devise pacts to outlaw war, turn the spotlight of publicity on those who build up great armaments, and proclaim to the world that our foreign policies are based on a rigid adherence to these ideals, but unless we are prepared at all times to support our principles with something more forcible than diplomatic notes and scathing editorial denunciations of another nation, we are deliberately inviting trouble. We may be *peace-lovers*, but if we are to discharge our messianic rôle of *peace-makers* we must possess the power and the will to use it, or crawl into our shell, say nothing, and be prepared to defend our own. If American idealism is to remake the world, we must return to the gentle but effective philosophy of our Rough-Rider President, "speak softly but carry a big-stick."

* * *

There is a limit to the patience of America's fighting men. It was reached in the summer of 1932 when Secretary of the Navy Adams and Admiral Pratt walked into the White House and conveyed to President Hoover in short, terse and unmistakable language the opinion of the navy towards Secretary Stimson's Manchurian diplomacy and notes that were pushing the nation to the brink of war in the Pacific. The navy was not prepared to fight. Japan could take the Philippines over night and it would require three or four years to retake them. The navy had fallen so far below its treaty strength that it would take eight years of steady building to reach its quota. At the very least, it would require two years to prepare for even defensive hostilities. Should war come, the nation would clamor for the navy to show results. As happened during the Spanish-American War, every port and seaside resort would demand protection. Such force as might be concentrated to resist attack would be dissipated. Our sailors would be forced out to

battle before they were ready. The navy has never forgotten the *Chesapeake* and the *Shannon*. It does not intend to be the scape-goat in another war for the glorification of pacifist statesmen who work out and lay down foreign policies without reference to the state of national defence or the ability of the navy to enforce them.

When Hitler tore up the armament clauses of the Versailles Treaty, the first impulse of the State Department was to indite a strong note of protest against this violation of the treaties and would have done so, had not General McArthur expressed the views of the army to President Roosevelt in language even more crisp than that employed by Admiral Pratt. It was not our fight. There was no reason for us to interfere. Never again would an American army cross the Atlantic to fight in Europe. We had our lesson and are now paying for our folly.

These two incidents convey to the intelligent student of political affairs that the American Army and Navy are determined to demand adequate appropriations for national defence that will

enable them to uphold the honor, dignity and security of the nation if the test is forced upon them. The enforcement of our present foreign policies calls for the most powerful navy in the world, two or even three times larger than its present treaty strength. Unless the American people are willing to vote the funds for its building and maintenance, they must modify their foreign policies and remain content with a navy sufficient for home defence. To permit the navy to fall so far behind the minimum strength required for this purpose while insisting on our right to intervene in foreign disputes is merely paving the way for the overthrow of our institutions and the setting up of a military dictatorship.

* * *

The United States are fortunate in their geographical location. No other nation is so favored. The American people can afford to be

peaceful, altruistic and conform to the rôle of the good neighbor. But should conditions change, should a powerful nation arise on the other shores of the Caribbean outnumbering us in population ten to one and twenty to one in armed forces and a pacifist congress should surrender one by one our guarantees of security, our military leaders would take over control of the government and the nation to a man would rally to their support. And the old conditions are changing. In fifty years, Brazil is expected to have a population of 200,000,000! What is to prevent these prolific people from breaking through to the Caribbean? Who can guarantee that a strong Confederation of Latin American states will not supersede the present set-up of small independent republics? Such a development, although remote, is within the realms of probability and the United States would then confront the same problems and the same menace that impelled Japan in self-defence to act while she yet had time to do so.

It is to be hoped that the policy of the "good-neighbor" may in due course bind these Latin American republics closely to the United States in lasting bonds of friendship, business and common understanding, but old hatreds and racial prejudices die hard. It



Nippon's War and Navy Chiefs General Senjuro Hayashi (right) and Admiral Mineo Osumi, (left)

"If the Empire desires peace, if the Army and Navy is to defend it against any combination of external dangers, we must be provided with the arms and equipment to discharge properly our duty. If the nation has reached the limit of bond absorption, taxes must be increased to meet our requirements," declare the heads of Nippon's fighting services.

is too much to expect that Mexico, Colombia and Nicaragua will ever forget or forgive and, should the time ever come, even in the distant future, when the United States is vulnerable, we may then pay for our past mistakes.

Forces in the Making

Forces are at work south of the Rio Grande to create just a situation. Despite the fact that the Monroe Doctrine was incorporated in the Covenant, the Latin American republics joined the League of Nations as the one hope and guarantee against possible intervention and aggression on the part of the Northern Colossus. The breakdown of the League has convinced our southern neighbors that their salvation now rests in their own strength. The Bolivar League and other Latin-American organizations have proclaimed as their objective a grand confederation of Latin-American republics, which the United States may join on a basis of equality but not as a dictator of policy and program. These ideals have captured the imagination of the younger Latin-American leaders and the movement, now in its infancy, carries its own warning.

If American foreign policy persists in blocking the legitimate expansion of other nations in their respective spheres, we must not be surprised if they resort to similar tactics against American trade and interests in Latin America. The trade of China may be essential to our future prosperity and happiness, but if to hold it, we are to sacrifice the good-will and business of our immediate neighbors, there is nothing gained. Something like that is taking place at the present moment. What we gain in China we lose in South America. If present trends are viewed from this angle, it would seem incumbent upon the United States to desist from further preachments of peace as the basis of its foreign diplomacy and begin to prepare to hold its own place and power in the sphere that God and Geography have set aside for it. For, should these hopes and aspirations of Latin-America be realized and our love of peace reach that point where those who direct our destinies should whittle away the nation's security to the vanishing point, there will be a change in our form of government, just so sure as it has happened in other parts of the world.

* * *

So we return to Secretary Hull's re-affirmation of basic American policy and apply it to conditions in Asia. His generalization on the recrudescence of the military spirit prevalent throughout the world must necessarily include Japan whose government has declined to be further bound by the limitations of the Naval Pact or the provisions of a treaty which circumscribes its right of self-defence while its next-door neighbors are permitted and even encouraged to increase their armaments out of all proportion to their needs for security. Since moving to defend herself against this menace, Japan has been the target for American censure and criticism, accused of violating the Nine Power Treaty and the Peace Pact of Paris. It is overlooked however that the interrelated Washington Treaties, the basis of American peace machinery, are accompanied by fourteen resolutions equally binding on all the Signatory Powers. These resolutions were passed after calm deliberation, approved and printed in the Treaty Section of the Official

Record of the Conference. They cannot be dissociated from the treaties in any discussion over their violation.

No mention is ever made of the equally pertinent fact that when the Chinese Delegation failed to induce the Conference to annul the 1915 Manchurian Treaties, it reserved the right "to seek a solution on all future appropriate occasions," thus removing from the provisions of the Nine Power Treaty the settlement of their dispute with Japan over her rights and position in Manchuria. This meant, if it meant anything at all, that the Chinese would enforce their viewpoint when they were strong enough in a military sense to reopen the issue with Japan. And there is evidence that the Chinese were preparing for just such an eventuality.

It can be argued that the army of Chang Hsueh-liang, numbering 400,000, supported by the largest arsenal in Asia, was maintained to impose the rule of the Young Marshal over the provinces South of the Wall, but, on the other hand, the Nine Power Treaty had been signed with the idea that China was a united nation, that would lead Asia along the pathway of peace and prosperity. The existence of the North-eastern army and the super-arsenal at Mukden could therefore be justified only on the grounds that its objective was a solution of the Manchurian questions left unsettled by the Washington Conference. When the Japanese army went into action on the night of September 18, 1931, the issues involved were outside the scope of the Nine Power Treaty and, by reason of Japan's invocation of the law of self-defence, outside the provisions of the Peace Pacts.

* * *

When China affixed her signature to the Nine Power Treaty she accepted the resolutions which form part of that treaty. In Resolution No. 10 she committed herself to reduce her armies (then estimated at nearly a million men) whose maintenance had become a severe drain on her resources and a constant menace to peace in Asia. If, as Mr. Stimson stressed in his open letter to Senator Borah, the Nine Power Treaty was essentially a disarmament treaty, then the heart of the treaty is Resolution No. 10 and it became the duty of all the Signatory Powers to demand strict compliance with its terms.

Did China comply with her pledge? Did any of the Signatory Powers carry out the implied obligation to assist China in reducing her armed forces? Within ten years, the Chinese armies were increased to nearly three million men with

another million or more armed communists, bandits and irregulars roaming the country-side, looting, burning and devastating. Who furnished these millions with modern military equipment? Who sold them the aeroplanes? Who taught their flyers to drop bombs on defenseless communities? Who profited from the sale of arsenal machinery? Who supplied them with tanks, heavy and light artillery, machine-guns, automatics, high explosives and all the other modern implements for mechanized slaughter?

Whence came the military advisors, the organizers, the instructors, drill masters, fortification experts, crack aviators, scientific bombers and others proficient in the modern art of killing? Where did the revenue come from which paid for these huge armaments? In many instances the purchase price was squeezed from an impoverished people through the enforced growing and sales of opium, in violation of treaties abolishing its cultivation. In the main,



A Tough Fighter for a Tougher Task. General Jiro Minami, Commander-in-Chief of the Kwangtung Army and Japanese Ambassador to Manchoukuo

With a skeleton army of 60,000, he is expected to suppress the always present bandit scourge in Manchoukuo, keep vigilant watch over 300,000 Soviet, 75,000 Mongols and 250,000 Chinese troops encircling and menacing the existence of the New State. Facing odds of ten to one, he recently ordered the Chinese armies to withdraw from the danger zone. They withdrew.

however, the money was furnished by the increased revenues from the duties on foreign trade, made possible by conceding tariff-autonomy to the Nanking Government. The spirit of the Nine Power Treaty and the solemn pledge of China under Resolution No. 10 were ignored by every Signatory, whose "merchants of death," supported by their respective diplomats, rushed to participate in this highly lucrative arms racket, legalized under a pact devised to limit armaments. Who then broke the pact? What can be said in favor of a group of signatories who closed their eyes to China's disregard of one of the most vital provisions of the treaty and who conceded to her a tariff autonomy which has provided the funds for the increase of her regular armies from one million to three million men and made possible the wars which in the last fifteen years have accounted for the deaths of five times as many as were killed in the World War?

* * *

It is also overlooked that another important measure was approved by the Washington Conference to fortify the Nine Power Treaty. Resolution No. 4 provided for a Board of Reference to be established in China to which questions arising in connection with the treaty could be referred for investigation and report. Had such a board been created and permitted to function many issues that now menace the peace of the Pacific could have been solved at their inception. Although this resolution was approved, adopted and included in the Treaty Section of the Conference, China refused to permit the board to be established. The Treaty therefore lost its principal aim and value. The Nine Power Treaty conferred on the "Republic of China" a Magna Charta to do as she pleased as a sovereign state and its rulers forthwith rejected the right of those who had recognized and established their independence to any further interference in their affairs or to sit in judgment on their actions. The Nine Power Treaty and its annexed Resolutions may be binding upon all other signatories, but it remains null and void as applied to its beneficiary. No Signatory to the Treaty has ever denounced China for violating its provisions or demanded that she comply with her obligations, even when failure to do so menaced the rights and vital interests of another Signatory held to a strict compliance with its terms.

Militarism as defined by the League and American statesmen seems to be an evil only when resorted to by those nations whose power to disturb the post-war set-up was limited at Versailles and Washington. The creation of an army of three million men in defiance of the plain resolutions of a disarmament treaty devised to reduce this menace, the recrudescence of the military and nationalistic spirit in a race of 500,000,000 discordant and warring tribes, is seemingly no menace to economic stability, peace and international sanity, so long as it does not imperil the security of nations separated by the width of a continent or the waters of the Pacific from the consequences.

The spot-light of publicity has not been turned on China nor has world opinion been marshalled against her militarists. Unless the Fourteen Resolutions which precede the texts of the Washington Treaties as published in the Official Record of a Conference whose

Delegates approved and affixed their signatures to these documents, are intended to be equally observed, the treaties which follow are reduced to a mere declaration of policy and justification for sanctions—were there any in contemplation—fails. To invoke the main treaty against Japan without reference to the Chinese reservation and the resolutions which interpret and define it, or with no consideration for changed conditions made possible by the failure to invite Soviet Russia to the Conference Board, would seem to be inconsistent with that spirit of fair-play and the basic law which underlies all treaties.

* * *

Notwithstanding that Communist propaganda, plots, strikes, labor riots, student unrest and other subversive activities, openly and confessedly directed from Moscow for the overthrow of our government and institutions, have reached the alarming stage where Congressional action on resolutions for severance of diplomatic relations has been held up at the urgent request of the State Department, American public opinion almost unanimously rejects the idea that Japan is entitled to take any steps to defend herself against a similar menace. Indifferent to the facts of history, the average American takes for granted that Soviet Russia in her own sphere can do no wrong.

Russia's defiant seizure of the Amur region and the Altai slopes from the Manchus, about the same time that the United States were separating Texas and the South-west from Mexico, has been justified and sanctified by international law and the inability of the victimized to reopen the issue. That the Manchus or their heirs may some day grow sufficiently strong to press their claims to sovereignty over this region in the same manner that similar territorial disputes rooted in past injustices periodically disrupt the peace of Europe, is a contingency that warns us that permanent peace and good understanding in Eastern Asia is as uncertain as in other parts of the world.

The March of the Slav

The eastward thrust of the Slav did not stop with the seizure of the Amursk. They jumped across the Behring Sea and then voyaged southward along the Pacific Coast until their flag was raised over California. The Monroe Doctrine, primarily directed against European aggression in South and Central America, was equally a warning to Russia that she had reached the limit of her acquisitiveness in North America. The impotent Manchus and the Hermit nation of Japan bowing to superior strength, acknowledged the legitimacy of the rape of Eastern Asia. The United States purchased Alaska and confined the Slav to his own continent where we have since recognized his hegemony and primary right of depredation, going out of our way to defend and preserve to him the enjoyment of his spoils. In effect, we constituted ourselves into a sort of guardian of Russia's interests in Eastern Asia, alert at all times to protest against any move on the part of Japan that might undermine or impair Slavic supremacy.

Although the object of the Washington Conference was to put China on her feet, the real beneficiary was Bolshevik Russia. Had Moscow called the Conference, drew up the agenda and dictated its



Mr. Yosuke Matsuoka, Governor of the South Manchuria Railway, the most important post in the Japanese Government

Nippon stakes her future on the organizing and administrative genius of the man who in a flash of patriotic fervor at Geneva told the assembled delegates that "Japan stood ready to be crucified!"

program it could not have done a better job for the advancement of its own interests. While the Conference was in session, an American army was in Siberia, part of an Allied expedition whose objective was to prevent Japan from acquiring any territory at the expense of the Russian people.

The motives which influenced President Wilson to dispatch an American Army to Asia will probably never be fully revealed but the unchallengeable facts remain that he did so in violation of the constitution, without authorization of Congress, against the advice of his highest military advisors and without funds legally appropriated to defray the expense. Had General Graves in command of the American expedition slipped or overstepped his instructions, the nation would have found itself in another war that might well have spelled defeat to the Allied cause on the Western front. Yet the only justification for our intrusion in these Asiatic affairs would seem to be Wilson's disapproval of the original plan agreed to by the Allied Supreme War Council that Japan be invited to occupy Vladivostok and keep open the Trans-Siberian Railway for which she was to be compensated by a slice of Siberian territory. Wilson

stood firm for a joint expedition and as a result Siberia and Eastern Asia was made safe for Communism. On the withdrawal of the inter-Allied forces, the Red armies of Moscow once more advanced into Manchuria facing the Japanese across the station platform at Changchun. The *status quo* was preserved in the Far East. Had the program of the Allied War Council been carried out, the eastward march of Communism would have terminated at the Urals.

On the very eve of the Disarmament Conference, May 31, 1921, Washington dispatched a note to Tokyo couched in the now familiar phraseology of American diplomacy, placing on record the concern of the American Government for the maintenance of the political and territorial integrity of Russia, declaring that it would not now or hereafter recognize as valid any impairment by Japan of these principles. Japan was then invited to attend the Conference where the same principles for the maintenance of China's political and territorial integrity were written into a perpetual treaty.

* * *

Bolshevist Russia was not invited to the Conference. She was then an unrecognized and outlaw nation, bankrupt, broken and not expected to get back on her feet for another generation, if then. Russia was out of the picture. But the interests of the Russian people in Asia were being scrupulously safeguarded. Large chunks from the main body of Russia could be carved out for the erection of new states in Europe to serve as a *cordon-sanitaire* against the westward spread of Bolshevism, but not one inch of territory could be alienated in Eastern Asia to set up a barrier against the spread of the menace eastward. The fact that all this territory had been stolen from the Mongolian peoples was ignored. It was now an integral part of "Mother Russia," inviolate against any attempt on the part of its original inhabitants to reassert their rights. The Allies, with the full support of the United States, adequately protected their own special interests in Europe and then Washington informed Japan that any attempt on her part to take the same precautions in her own sphere would never be recognized. When the Washington Conference terminated, the outlawed state was presented with a charter to do as it pleased in Asia without fear of



Leader of Nippon's Finances—Korekuyo Takahashi. He sounds the note of warning that the limit of appropriations for the Army and Navy is being reached.

interference. The only effective check ever devised to keep Russia in her proper place was the Anglo-Japanese Alliance and this had been discarded to placate the United States—and the British Dominions—in order to assure peace in the Pacific. It would be difficult to find in all history another similar example of shortsighted diplomacy.

Causes and Effects

To this lack of prescience is traceable all the troubles and woes that have since befallen the Far East. So intent were the Powers on curbing Japan, so hypnotized with the idea that China, if encouraged to take her place in the family of nations would discharge faithfully her international obligations, serve as a buffer between Japan and Russia and preserve a proper balance of power in Eastern Asia, that no thought was given to any possible slip-up in this program. Except for a pledge to communicate fully and frankly with each other in the event of any question arising over China, no provision was made in the treaty for a change in conditions.

Although Japan was committed by Article VII to full and frank discussion in any question involving the territorial or political integrity of China, this clause could not be invoked to cover any action she might take to defend herself against a non-signatory state even though in so doing she violated the territory of China. Had China lived up to her commitments under the treaty, or had the other Seven Signatories protested against Soviet Russia's moves in Central and Eastern Asia, there could be no justification for Japan acting alone without previous consultation with the other Powers. Under the circumstances, to do this Japan would have been required to subordinate her sovereignty and submit her right to act in self-defense to the decision of a group of powers, jealous of her growing military strength and trade expansion. This, no self-respecting nation will do.

Whether Japan was justified or not in what she did to escape from this straight-jacket will remain a highly controversial question until such time as the major issues involved are definitely settled, let us hope, by diplomacy. In the present temper of the American people and their Government, the mistakes of the Washington

Conference will never be admitted, nor will any attempt be made to rectify them. Like the subsequent Peace Pact, the Nine Power Treaty will remain in force, to run "forever and forever," as "long as the sun shines and water flows." We will never recognize that Japan may have vital interests which it is her duty to defend, when these conflict with ideals we have erected into law for the guidance of mankind.

The American Government, standing on the treaties and its own interpretation of their texts, has judged Japan, placed on record its verdict and induced the League Powers to endorse it. The United States seemingly will not recognize what Japan has done to defend herself against "*the menace from the direction of Urga*." This diplomatic phrase was first employed by Viscount Chinda in explaining Japan's refusal to pool her Manchurian railway rights in the new Consortium, contending that these lines were essential for the defense of Japan and China against the menace that loomed just over the Manchurian border. At the same time, the military chiefs of Japan in a secret conference with Major-General Leonard Wood held in Tokyo in September, 1921, placed their cards on the table and told him that Japan would brook no interference with her rights and position in Manchuria. Japan would fight.

The American Government can do nothing to check Russia or regulate the size of her armies. The Chinese disarmament resolution of the Washington Conference is a dead-letter. Japan is therefore thrown upon her own resources, standing alone with the whole world lined up behind Washington to deny to her the right to defend herself against a menace permitted to grow to formidable proportions through racial prejudice, idealistic diplomacy and a refusal on the part of western statesmen to face the realities.

* * *

It seems useless to review the events of the past fifteen years or recount step by step how prostrate Russia recuperated and reconstructed her army until to-day she is the strongest military power in the world. It is needless to invite attention to her annexation of Outer Mongolia before the ink had dried on the Washington Treaties, how she subsequently extended her influence into South and Central China, until to-day the recognized government at Nanking is fighting for its existence against the Communist hordes who have converted the Yangtze region into a shambles. It is futile to stress that Hsinking is now a dependency of Moscow. Whatever Russia does is correct.

The issue in China is clearly one between Chiang Kai-shek and what for want of a better name is called Communism, with the armies of Canton and the South-west patiently awaiting the opportunity to jump in, finish him off and grab the power that goes with foreign recognition. It is true that the armies of Soviet Russia are taking no part in this movement for the conquest of China, but the guiding hand and genius of Moscow is there just the same. It may be equally true that the starving peasants of China do not know what Communism means, any more than they can grasp the idea of a republic, but the fact remains nevertheless that these hordes of desperate people are led by young men and women educated for the purpose at the universities of Moscow and Tashkent. The struggle for the communist domination of China did not cease with the hurried departure of Borodin and Galens from Hankow in 1927. The movement which started in Canton in 1925 has gathered momentum with the years. It will never stop until the last groups of Communists are rounded up and disarmed or driven across the borders to seek sanctuary in Soviet territory.

What the Future Holds

It is premature to state that Chiang Kai-shek has pacified the Yangtze Valley and Szechuen. Much progress has been made but forces are at work that may change the picture. Should Chiang die, should he fail to suppress the communist movement, and the campaign be prolonged until he reaches the end of his resources and provides the opportunity for Canton to avenge his desertion of the Southern cause, the next government of China will be Red, another Soviet Republic added to the system taking its orders from the Kremlin. The armies of the Yangtze and South China, two million strong, would then prepare to subjugate North China and Manchoukuo. The Far Eastern Red armies with their Mongol allies would march in unison and the jaws of the Communist nutcracker close on Manchoukuo. General Blucher (formerly Galens), that gifted Red organizer who led the Nationalist forces to victory

in 1927, is now Commander-in-Chief of the Soviet Far Eastern divisions with his headquarters at Kharbarovsk, in constant touch with his old comrades-in-arms in South and Central China. The implied threat to Manchoukuo and Japan cannot be waived aside as of no consequence.

China has the undoubted right to work out her own destinies without outside interference, but when this right is taken advantage of by another nation to spread its doctrines and impose its form of government and rule to the point where it endangers the stability, the institutions and the life of another state, it becomes a very delicate question as to whether or not the latter is justified in taking steps to protect itself or how far other Powers are warranted in invoking treaties that deprive it of the right of self-defense. In the answer to this, lies the crux of the Far Eastern problem. Treaties which pledge Japan to respect the territorial and political integrity of China are not binding on Soviet Russia. Unless the Signatories to the Nine Power Treaty combine to bring pressure to bear upon Russia, there is nothing left for Japan but to act while she has time to do so and in any way she deems most appropriate. The future of Japan is indissolubly linked with the outcome of the struggle in China.

* * *

Since the signing of the Washington "Disarmament" Treaties, Soviet Russia, free from molestation or pressure from the outside, has built up the most awe-inspiring military machine in this age of big armaments. Estimates differ, but the latest figures indicate that the Red Army now numbers 1,300,000 men, with 300,000 or more strung out along the borders of Manchoukuo from Vladivostok to Chita. The independent Soviet Republic of Mongolia is credited with the possession of an army numbering 75,000, drilled and led by Soviet officers.

Steel mills, blast furnaces, munitions factories, strategic railways and highways have been built or are building in Siberia. Modern fortifications line the banks of the Amur. Huge air-fields have been laid out. Knocked-down submarines have been transported by rail and steamship and erected secretly at the port of Vladivostok. Eastbound troop and munitions trains clog the sidings of the Trans-Siberian Railway. New railways linking Mongolia with the main artery of Soviet communications are being rapidly constructed. These are only the high lights of a picture which reveals that while Japan was reducing her land forces to 230,000, the minimum for defense, Russia has built up an army which outnumbers her six to one! When, to this inequality, is added the huge armies of China and the Red-officered divisions of Mongolia, we have a total of 4,375,000, a top-heavy advantage of twenty to one! If the million or more Communists, bandits and irregulars of China are included, the odds against Japan are twenty-five to one!

Where the Rules are Reversed

Strategic considerations which determine the degree of security and factors which enter into calculations for striking a balance in armaments in other parts of the world do not apply in the Far East. Here the rules of the game are reversed. It is urged that the main Soviet army could not be dispatched to the Far East because of distance, inadequate transportation facilities, difficulty of supply and above all because should it be withdrawn from European Russia, uprisings, revolution and overthrow of the Communist state would follow. In effect, the principal object of the Red Army is to keep the people of Russia in subjection and guard the Western front.

The same reasoning applies to the huge Chinese armies maintained to keep the "stupid people" in servitude and provide a "living" for their military taskmasters. The enslavement of nearly 700,000,000 human beings under the new Russian and Chinese conception of the sovereign state does not come under the definition of militarism. The lives of millions of Chinese or Russian peoples may be snuffed out under such a system but it does not affect the good standing of their rulers in the family of respectable nations.

The argument is seriously advanced that the Chinese armies do not count, that they will never combine and fight a foreign invader. Notwithstanding that China possesses armies outnumbering the combined forces of all other nations, the allegation that she is not a military nation is accepted as a fact upon which disarmament treaties are based. Limitation of armaments is not intended to apply to China. On the contrary, the Chinese are

encouraged and even financed to purchase arms, bombing planes, tanks, motor transport and other mechanical devices for the modernization of their armies. Reports from foreign commercial attachés in China glowingly stress the construction of thousands of miles of highways, creating markets for motor vehicles and the wonderful progress in establishing new commercial air lines. They fail to mention that these hastily built roads are primarily to facilitate the passage of armies and that civil air lines and landing fields merely camouflage the program to build a formidable military air service.

Unless the Chinese are totally deficient in fighting spirit, the time must arrive when their armies will constitute a menace even greater than those of Soviet Russia. No modern nation would dare base its power of offense or defense on the theory that the fighting quality of its soldiers or sailors is superior to that of a hypothetical enemy. Nations with long traditions of successful warfare may secretly hold in contempt the fighting abilities of others with less glorious records and cherish the belief that one of their fighting men is equal to two or three such adversaries, but they would never have the presumption to openly proclaim this sense of superiority as justifying an inferior ratio in the size of their armaments. Even such self-confident nations will demand full equality and in some cases even a superior ratio should there exist a remote possibility that two neighbors might combine against them. The fighting qualities of peoples cannot be capitalized in an international arms agreement.

A Day of Reckoning

Possessing armies outnumbering the combined standing forces of all other nations, China enjoys the sole distinction of lacking the morale, the spirit and will to fight in self-defense, a stigma no other self-respecting nation of to-day would rest under. The implication in itself is an insult that intelligent Chinese deeply resent and look forward confidently to the time when the disgrace will be removed by a victory over a foreign foe. Should that day ever arrive, the whole psychology of the Chinese will be metamorphosed and the world will then confront an aroused and enthusiastic people who will demand and exact respect for their viewpoint. In the meanwhile, the Western world is intent upon hastening that day of reckoning by pouring into China all the modern mechanical appliances for scientific slaughter.

The little Japanese army of 230,000 has accepted without a protest this inequality, relying on its superior fighting spirit, its mobility and up-to-date equipment to hold its own against the 3,000,000 Chinese, a dangerous and wholly unprecedented assumption of superiority and taking on of odds that no Western nation could or would concede under similar circumstances. How long the Japanese can afford to labor under such a disparity is merely a question of the time required to build up the morale of the Chinese fighting man through proper leadership and mechanization of equipment. That time limit is rapidly being reduced, forcing upon Japan the necessity of taking prompt and adequate steps to maintain her superior military position or convince the Chinese that they must organize and co-operate for mutual defense. Should Japan fail to win the confidence of the Chinese, should her program and policy of conciliation be rejected and the Chinese continue to rely upon Europe and America, Japan may find herself in a serious and desperate situation.

It would seem from these figures that Japan has sufficient worries in China without being everlastingly on her guard in Manchoukuo. The Japanese army in the new state, now about 60,000, is kept busy suppressing the perennial crop of bandits (whose number is now placed at 28,000) and guarding the frontiers against raids from the outside. In addition to the 300,000 Russians and 75,000 Mongols encircling the new state on the north and west, there was, until recently, another 200,000 or more Chinese troops garrisoned south of the Wall, awaiting an opportunity to re-establish the rule of the war-lords over Manchoukuo. These figures would indicate that the Kwantung Army of 60,000 is facing odds on the ground of ten to one, a disparity that can be justified only by a strong and abiding sense of their superior fighting competence, mobility and the assurance of prompt reinforcements from Japan.

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Now the General Staff of the Japanese Army presumably functions true to type. The peaceful protestations of Moscow, her iterated and reiterated desire for disarmament advocacy of

non-aggression pacts, abandonment of her program for world revolution, adherence to League principles, condemnation of imperialism and other policies which indicate a change of tactics, if not of heart, can be accepted at their face value. That the armies of China constitute no immediate menace to Japan can also be conceded. The diplomats and financiers of Japan may cherish the honest belief that a program of conciliation will pave the way to amity and economic co-operation, but all this cannot and does not change the basic strategic picture. Should the military leaders of Japan relax their vigilance, should they accept conditions in Asia as the rest of the world would have them do, should they permit events to take their logical course, it would not be long before they would face another Sino-Russian combination to drive them out of Manchoukuo. Should the Soviet Far Eastern divisions join with the Chinese south of the Wall or should they contact through Mongolia with the communists in Kansu or Shensi, and move in concert in a surprise advance, the initial advantage so gained might decide the outcome of a war before Japan's full strength could be thrown into the field.

Russian military moves in Eastern Siberia, the reinforcement of her Far Eastern army, the strengthening of fortifications, the tightening of Soviet control over Outer Mongolia, the advance of its influence into Hsinking, the announced program for the immediate construction of several new railways penetrating Mongolia from the north and west, the double-tracking of the Amur and Ussuri lines, the reported proposal to Nanking on the part of Moscow for the conclusion of a Sino-Soviet offensive and defensive alliance against Japan, the refusal to permit the "independent" republic of Mongolia to establish diplomatic relations with its neighbors or to open the country to foreign trade, travel and residence, viewed in connection with the northward retreat of the Chinese Communist armies into Shensi, Kansu and the North-west, the disturbing activities of the Northern Chinese armies in the demilitarized zone and Chahar, the series of incidents following in rapid succession all along the borders of Manchoukuo, may or may not be correlated. On the other hand, their cumulative effect would indicate the existence of a deep laid plot to encircle Manchoukuo and throw her into confusion at several points simultaneously. The strategic significance of these moves could not be ignored by any army exposed as are the Kwantung forces of Japan to such coincidences.

"Jittery Japan," screams the press of America. Sure, Japan is jittery. She has laid her course in Manchoukuo and staked her future on the outcome of the adventure. She cannot recede. If she fails to hold her position, she goes under and becomes a little third-rate state taking its orders from Moscow. Any move or combination of moves that tends to impair her strategic position must be countered and checked at the outset. The army of any other nation placed in such an exposed position with world opinion marshalled against it and encouraging its foes by word and deed to press forward, is bound to be jumpy, suspicious and to magnify incidents which appear to the outsider as unimportant. The Kwantung Army dares take no chances. It moved to eliminate this menace in the only place and in the only effective manner open to it. By demanding that the Chinese armies withdraw from North China and that a new autonomous government take the place of the anti-Japanese clique that was fomenting trouble, the Kwantung Army cleared its southern and southwestern flank of potential foes, thwarted a Soviet thrust from Urga to Kalgan and made impossible the encirclement of Manchoukuo by the combined Soviet and Chinese forces.

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For the moment, a strategic balance has been attained. Japan is now intent upon consolidating and stabilizing this condition by insisting that China put her house in order in the North, call a halt to further anti-Japanese activities, co-operate for the development of this region and contribute her share towards mutual defense. There is a renewed interest in Sino-Japanese amity. The newspapers are full of schemes for the economic and agricultural development of North China, of cotton and tobacco cultivation, new textile mills, industrial plants, opening mines, and other large scale enterprises, calling for huge investments of Japanese capital. But realization of these "dreams of paradise" hinge on the construction of several essential railways.

Three of these projected lines constitute the key to success. When the Shantung Railway is extended from Tsinan to Changte where it can hook up with the Pekin Syndicate coal road and the

Chengtai line is carried from its eastern terminus through to Tsangchow and the sea at Taku, when the line into Jehol is pushed through to Kalgan and the Peking-Suiyuan railway terminates at Ninghsia or Lanchow, a wedge will be inserted in the jaws of the Communist nut-cracker. The Yellow River then becomes the natural frontier of the new North China-Manchoukuo bloc and the three parallel east and west railways the strategic lines of military penetration from the sea protecting the region against invasion from the south and in like manner assuring to Central and South China the continuance of their existence as Chinese states.

British Interests Safeguarded

Japan has reverted to the old "sphere of influence" doctrine which went into the discard with the Nine Power Treaty, by which she effectually safeguards her political interests without conflicting with the Open Door principle or impairing in any way the sovereignty and integrity of China. In effect, Japan has duplicated in the north—and for the same reasons—what Britain in 1898 did in the Yangtze Valley, supplementing, strengthening and consolidating the British position by interposing another and more formidable barrier against the southward penetration of the Muscovite and his schemes and intrigues to reach the north-east frontiers of India through the territory of China. British trade and investments in North China may be impaired by Japanese activities but the larger and more important British imperial interests based on India will be strengthened. The practical political effect of Japan's recent moves is tantamount to a revival of the objects of the old Anglo-Japanese Alliance as far as it pertained to Eastern Asia. The errors of the Washington Conference are being corrected. Russia is once more confined to her own sphere confronting the Japanese Army in Manchoukuo with the last act of the Red drama being staged in Szechuen, the key to the north-east passes into India. Should the Communists gain a strong foothold in Szechuen their next move would be into Tibet.

It is no secret that the Communists planned to force a way into Szechuen and open a direct route between that province and Moscow. Szechuen was to become the new center of Communist influence, safe from attack by the armies of Nanking. "He who rules Szechuen, rules China" is an old, old adage. This will help to explain why Chiang Kai-shek has been isolated in Chengtu during the recent developments in North China. The fate of China, of India and perhaps Japan depends on the outcome of Chiang's drive. It may also help to understand why all the talk about Anglo-American co-operation to coerce Japan must give way before stern realities and, why British sentiment is swinging around in favor of Japan notwithstanding her apparent flouting of the Nine Power Treaty and the possible damage to British prestige and trade in North China as a result of Japan's moves.

A Policy of Compulsion

Call it imperialism, militarism, aggression or what we will, but the inescapable fact remains that if Japan is to survive she has no option but to demand from China an immediate cessation of all anti-Japanese activities and such guarantees as will adequately safeguard both nations against a menace that can no longer be ignored. The very essence of Japan's move is the maintenance of peace. It is doubtless all wrong, immoral, and a violation of treaties, but no legal consideration will deter any strong power from taking similar steps to defend itself when its existence is placed in jeopardy by the breakdown of government and the inability or unwillingness of a neighbor to discharge its natural and legal obligations.

Once again, world censure and criticism will be directed against Japan, with every radical, socialist, liberal and pacifist orator and editor fulminating against her. The world will sympathize with peaceful Russia and her army of 1,300,000, it will weep over weak and defenseless China with her armies of 3,000,000 braves who wage incessant war against each other, it will invoke treaties, marshal world opinion and anathematize Japan whose army of 230,000 is pitted against conditions and odds that in any other part of the world would long ago have culminated in an explosion.

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Economic forces, population increase and foreign pressure upon Japan have played a prominent part in influencing her recent

moves in China. But unless the military situation is constantly kept in mind, it is impossible to understand why the Japanese Army has time and again interfered with the direction of foreign policy. The Japanese army is and must be realistic. The army cannot escape the implications of a chain of circumstances, events and coincidences which, if permitted to develop unchecked under a conciliatory diplomatic program, would be construed as a sign of weakness and give rise to further explosive incidents that sooner or later must end in hostilities.

The forces at work in China Proper, in Central Asia, in Mongolia, Hsinking and Tibet cannot be regulated by treaties or held in check by diplomacy. The combined fleets of Europe and America can exert no pressure in regions thousands of miles from blue water. Pitiless publicity, fulminating against aggressors, and all the other machinery devised to implement the peace pacts, can have no effect on the drama being enacted in these hidden wastes of Central Asia. Constant vigilance and preparedness is the sole price of Japan's security against these conditions. Britain, France and America are concerned chiefly with their trade and investments but Japan faces in addition the political and governmental chaos in China, a growing military menace, and the slow, steady onward penetration of doctrines and ideals that place in jeopardy her institutions, her industry and her existence as a state.

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In effect, Japan confronts a unique situation, without parallel in modern history, a wholly unprecedented, inexplicable and unjustifiable application of unequal armament and defense principles that could not be duplicated or applied in the West without precipitating a showdown. The Powers say to Japan that she must adhere faithfully to a permanent treaty under whose provisions China and Russia have built up armies outnumbering her own twenty to one. Japan must take no steps to escape from this trap while China and Russia are conceded all the time necessary to prepare and unite for her undoing. Japan must interpose no objection while the other Powers are pouring aeroplanes and modern military equipment into China, mechanizing her armies so they will be in a better and stronger position to try conclusions with Japan. Straining her resources to the breaking point to obtain the ¥650,000,000 for the mechanization and modernization of her army, Japan is denounced as "militaristic" while her Communist neighbor appropriates six billion or more roubles for the same purpose! How much do the armies of China cost? The maintenance of three million men in the regular armies of the war-lords and supplying them with modern equipment runs into figures which cannot be calculated by comparison with Western standards. Even if they are not paid, they must be fed, clothed, housed, armed and munitioned to say nothing of aeroplanes, motor transport, artillery, rapid-fire guns, explosives and all the other accessories of warfare. When to this is added the bill for communist and bandit upkeep, the toll exacted by famines, destruction of property and wealth, losses through unemployment, interruption of communications, confiscation of railway rolling stock, breakdown of industry, trade and agriculture and the ruin and desolation which follow in the train of these evils, some idea can be formed of the cost of militarism in China. When the Chang regime could issue seven billion dollars in irredeemable paper notes and foist them on the people of Manchuria in the few years of their reign and other war-lords could fill their treasures from opium revenues and taxes collected twenty to fifty years in advance, it is not difficult to understand what is wrong with China. The annual drain on the wealth of the country cannot be far short of two billion dollars or roughly \$700,000,000 in American coin, or three times the amount required for the military budget of Japan! Yet China is not militaristic. Only Japan, staggering under the burden of taxation imposed upon her by her peace-loving neighbors in Asia is guilty of disturbing the peace by building an excess of armaments. In addition to this tremendous handicap, the Naval Powers calmly notify Japan that she must accept an inferior naval status so in the event she should break through the land trap they can bring pressure to bear on her from the sea!

What Japan Faces

Japan sees on all sides preparations going forward to encircle and bring this pressure to bear upon her. The feverish expansion of China's air forces, the proclaimed program of the Reds and South China generals to wage a "Holy War" against Japan, the Far

Eastern aerial activities of Soviet Russia, the extension to Eastern Asia of American commercial lines hooking up with their Chinese partners, the creation of a closed military and naval long-range aerial base in the Western Aleutians, the extension of British, French and Dutch lines to Hongkong, making this British outpost the hub of aerial activities in Eastern Asia, and endangering Japan's control of the Formosa Channel, the establishment of air fields on the little French islands in the South China Sea, together with the refusal of China to concede aerial landing privileges to Japan, convey their own story. Japan's delay in building up her aerial routes and defenses has left her so far behind in the race that it is extremely doubtful whether she can retrieve her error in time.

Impregnable under the present naval ratio from the sea, outnumbered twenty to one but confident of her ability to hold her own against these odds on land, Japan is vulnerable only through the air. The verdict of the League and the United States stands in the record. No court exists before which an appeal can be made. The case against Japan and Manchoukuo is closed. Japan cannot and will not recede. There is no indication that the attitude of Washington and Geneva has softened. On the contrary, all evidence points the other way. Should a major clash develop along the borders of Manchoukuo and should world opinion, already incited against Japan, condemn her as the aggressor, she would find herself in a desperate plight because of inadequate air defenses. There is no need to labor the point. Japan has no option but to increase her armaments while she still has time to do so. Stabilization of conditions in Europe, a return to normalcy in the United States, the wind-up of the anti-Communist campaign in Central China, the conclusion of the gigantic Soviet development program in Siberia, Central Asia and Mongolia, synchronizing with the encirclement of Japan by the commercial air lines of the Western Powers are possibilities that must cause deep concern to those entrusted with the defense of the Empire.

Japan still enjoys a period of grace, two, three, or perhaps five years, depending largely on the outcome of the situation in Europe and the time necessary for the interested Powers to arrive at a common understanding. If, during this respite, Japan can persuade China to co-operate for the solution of problems that will establish and guarantee their mutual existence, she has little to fear. If, on the other hand, she cannot convince China of her sincerity and good-faith, if, relying on outside support, the pro-Western Group at Nanking supported by the pro-Moscow South-western Government, gain the upper hand in control of China's destinies, then Japan's future is dark indeed.

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Peace can be assured only by being at all times prepared for war. If that is the highest duty of a nation, then its War Ministry might more faithfully be called the Peace Department. The army of a country whose objective is the maintenance of peace is quite a different thing from the army of a country on conquest bent. It all depends on the point of view. Other nations may condemn Japan as militaristic but the Japanese see themselves in a different rôle imbued with the same chivalrous characteristics which would correspond with the ideals of a country prepared to fight only for the noblest of causes. When these ideals are synonymous with national defense and a continued existence as an independent people, the combination is one that reaches the highest conception of patriotism and sacrifice.

Some nations, secure in their isolation and confident in their strength, resources and ability to repel invasion, have never prepared for war. Such nations breed pacifists. They have invariably been caught unguarded, disqualified and unequipped when the call to arms sounded, yet these visionaries living in a fool's paradise of their own making, are the first to sit in judgment on other peoples confronting realities which cannot be evaded by shutting their eyes and saying the danger does not exist. Some nations are exposed to dangers which demand everlasting watchfulness and preparedness. Europe is full of such as these. Japan is in the same boat. Should she go to sleep, relax her vigilance and disarm to please the dreamers of America, nothing could save her from disaster. The odds against Japan fully justify her "Peace Ministry," working in conjunction with diplomacy, to exert every effort to eliminate conditions and factors which make for war. And one of these is a reduction of the Chinese armies in conformity with the resolution of the Washington Conference, or failing this, their removal from the zone of explosive possibilities.

Is Japan justified in seeking in her own way a solution of difficulties created by the operation of an "unbreakable treaty" and the inability or the unwillingness of the Powers concerned to take appropriate action to correct their errors? Is she within her rights to insist on the same security that every nation in Europe is now demanding? In view of the constant menace to peace, is she justified in ordering the withdrawal of the Chinese armies from a strip of territory contiguous to the new state she has pledged herself to defend? If the Japanese army is bent upon the maintenance of peace, restoration of law and order and the liberation of millions of human beings from the tyranny of military and bandit overlords, can she be held guilty of aggression or violation of pacts which legalize, encourage and perpetuate this menace to good neighborly relations?

Japan has no desire or intention to extend her influence south of the Wall except in so far as she can assist the Northern Chinese to stabilize conditions under a government of their own choice. On the establishment of such a government free from Kuomintang control, Blue Shirt terrorism and anti-Japanese agitators, depends the restoration of law and order, the opportunity of the people to engage in their peaceful occupations and the revival of commerce, industry and agriculture. Economic reasons enter largely into any explanation of Japan's recent moves in North China but behind all these remain the grim realities that make the preservation of peace an imperative necessity.

To attain this ideal, Japan will be called upon to pour millions of her hard-earned yen into railway construction and co-operative enterprises in North China, an additional drain on the national economy that can be justified only by the exigencies of a strategic situation demanding prompt attention. Whether Japan's capital goes into increased armaments or schemes for the development of North China resources, the objective is the same, the erection of a neutralized zone that will permit her diplomats a freer hand in negotiating a peaceful solution of other important issues and her army to concentrate its attention on the more immediate problems of defense pressing in upon it from many sides. On the outcome of Japan's new adventure in China hinges her future as a great nation. This is the task entrusted to Mr. Y. Matsuoka recently appointed President of the South Manchurian Railway with the approval of the Army.

So we return to our text. What is militarism? Who is to define it? Who is to set himself up as judge? Who is guilty of practising it? Before we turn the spotlight of publicity on those we adjudge guilty, before we marshal world opinion against the alleged offender, before more fuel is added to the fire and we get all tangled up in our own interpretation of treaties, let us pause and review the facts without prejudice.

Tokyo Electric Expansions

Tokyo Electric Light Co. is to raise its capital from Y.429,552,000 to Y.700,000,000 within the next two years. For the next five years the company needs approximately Y.190,000,000 for expansion. Power supply by Tokyo Light at the end of 1933 totalled 840,000 kilowatts. This has since risen to 920,000 kilowatts. To meet the increasing tendency, the company will build four stations with an aggregate generating capacity of 200,000 kilowatts by the end of 1938, including 100,000 kilowatts by the end of 1935, 50,000 kilowatts by the end of 1936, and 50,000 kilowatts by the end of 1937. In addition, the company intends to build the Onogawa Hydro-Electric Power Station, 26,000 kw., before 1939. A general outline of Tokyo Light's increased power generation plan embraces the following:—

STEAM POWER				
First half, 1936	Tsurumi	..	..	100,000 kw.
Second half, 1937	..	..	..	50,000
Second half, 1938	..	..	..	50,000
Total	..	..	..	200,000
WATER POWER				
Second half, 1936	Onogawa	..	..	26,000
Second half, 1938	Akimoto	..	..	93,000
Total	..	..	..	119,000
Combined total	..	..	..	319,000

Japan and China Join Hands

By C. J. LAVAL

DECISIONS taken at recent Councils of State at Nanking after a mid-summer season of political anxiety carry a better augury for the future than has been heard in months in the troubled land of Cathay. It was the act of a true patriot on the part of Wang Ching-wei to rise superior to the handicap of physical ills and override the crisis that impended in the Government, taking up again the onerous burden that impaired health forced him to seek to thrust aside by resigning, and addressing himself to his difficult tasks as President of the Executive Yuan and concurrently Minister of Foreign Affairs.

It may not be too much to say that a very real danger for China has been averted and the course of national affairs turned in a direction toward the light as the outcome of the visit to Nanking and the conferences there and at Kuling of Generalissimo Chiang Kai-shek, Mr. Wang Ching-wei, the Ambassador to Japan, General Chiang Tso-ping and other high officials of the Chinese Government. Gen. Chiang Tso-ping, the Ambassador to Japan, said at Nanking and repeated in interviews in Shanghai before he sailed to return to his post at Tokyo that the leaders of the Chinese Central Government "desire to see the realization of Sino-Japanese economic co-operation," and he added that as such co-operation is mutually beneficial to the two countries he will strive to promote it in collaboration with the Japanese authorities.

What carries the aspect of a policy of expediency—compulsory expediency, if this phrase pleases better—may well in future times be seen to have been the single sure course to steer through troubled seas in bringing the Chinese Ship of State at last safe to port. Through the recent distressed years the great powers of the western world, one and all, have voiced the pious hope for a prosperous and peaceful—and, to be sure, a profitable—China, but when the reckoning of the present day is cast it cannot be recorded that any of them have accomplished any concrete thing to infuse reality into this hope. What the western world, preoccupied with concern for its own existence, will do or can do for China is a nebulous speculation at best. Chinese statesmen no longer have theories to face. They are harassed by desperately pressing facts and problems that cry for immediate solution. Is it to be wondered at then that they do not stand patiently hopeful, seeking signs of help in a mirage overseas? Isn't it simple wisdom for them to employ the assistance that is surer and is closer home?

Facts Overlooked

In many organs of public opinion abroad one may read a vast outpouring of views under the generic heading of "Japanese aggression in northern China." What these writers abroad usually fail to take into consideration is the true state of affairs in the Far East. They do not disclose or even mention the problems or the very real dangers that Japan is facing against odds. It is not seen by them that measures that Japan must take for her own safety are thrust upon her and that lines of action are laid by conditions that she must carry out in defiance of an unsympathetic world merely to survive. To save herself or be of assistance to China or to preserve peace in the Orient, Japan has no choice but to act.

Chinese leaders have a better understanding of these things. These problems and, particularly, these dangers, are the problems

and dangers that China herself has to deal with. Competent Japanese statesmen have repeatedly declared in all solemnity that Nippon has no intention to annex Manchoukuo and Chinese leaders know that, of necessity, this is a truth, and they have come to realize that the Japanese advance on the Asiatic continent is not an invasion. The very circumstances that surround the wish of Japan to co-operate and assist China carry proof of the sincerity of the Japanese desire because the mutual advantages to be gained through co-operation of the two nations are obvious, both to Japanese and to Chinese, and the hazards of independent action also are apparent.

China's problems of the present day perhaps are graver than they have ever been before. With the rest of the world China has suffered from the general depression, but it is only in recent months that have seen banking and commercial failures mount into hundreds when the financial anxiety has reached the proportions of a near panic. This situation is attributed in large measure by spokesmen of the Chinese Government and others to the effects of the American Silver Purchase Act of June 19, 1934, causing an unprecedented drain of silver from China. In addition to the ills that afflict the rest of the world, China in recent times has had to struggle against and overcome fighting and internal disorders, disastrous floods and

natural calamities followed by an open rebellion against the Government in the province of Fukien and while military expenditures have mounted enormously until they consume eighty per cent of the country's revenues, due to swiftly shrinking trade with consequent decreased customs receipts these revenues have dwindled steadily, causing deficits that yearly grow larger. It is estimated that eighty per cent of the people of China live on the land and the plight of this mass of humanity, approximately 360,000,000 souls, is such that they have reached and passed the point of desperation. These tillers of the soil of China are in the last analysis the nation's only important producers, for according to authoritative estimate, China

only has about a million and a half productive laborers, or about 0.3. per cent of the entire population. The hundred and twenty million urbanites who live in the centers of population are consumers and produce nothing.

A Notable Record

In passing, it is to be recorded to the credit of the administrators of China that despite all the adverse elements of the situation a measurable degree of progress and betterment in various fields has been achieved. Marked improvement in communications has been brought about. With the aid largely of loans obtained from the British Boxer Indemnity Refund and through internal loans, new railway links are being constructed. Extension of the Chekiang-Kiangsi railway from Nanchang to Pinghsiang, about 300 kilometers, to connect the line with the Canton-Hankow Railway is being pushed. Negotiations are under way between the Ministry of Railways and Chinese banks in Shanghai for the issuance of a loan of \$80,000,000 and contracts with European concerns for rolling stock, rails, bridge steel and other equipment to a value of more than \$10,000,000 are to be let in the near future. The Yushan-Nanchang section of this railway, 300 kilometers, begun a year ago is nearing completion and eventually will be extended to Kweiyang, Capital

A VIEWPOINT FROM THE U.S.A.

Chiang Kai-shek and the imperialist lords of China think they are dealing with another Taiping rebellion that ran its course and died. But they do not and cannot read history aright. The Taiping rebellion took place in the period of industrial capitalism, in the early days of the foreign domination of China. The Red Army of China marches in the era of the decay and death of world imperialism, when the proletarian revolution in the imperialist countries gains force and power, and when one-sixth of the world lives under the banner of Soviet power and Socialist construction.—*Excerpt from article in "China To-day," June, 1935, published at New York by Far Eastern Group of American Communist Party.*

of Kweichow Province and thence to Chungking on the upper Yangtze in Szechuen. The Sian-Lanchow line, 700 kilometers, extending the Lunghai Railway is being built and plans are under consideration for construction of two other lines connecting Sian and Chengtu in Szechuen and Wuchang and Chungking. The Wuhu-Nanking section of the Kiangnan Railway was completed early this year. A project for the rebuilding of the Yellow River bridge on the Peiping-Hankow Railway at an outlay of \$20,000,000 is being planned. In the past three years the Ministry of Railways has purchased 59 locomotives, 775 freight cars and 24 passenger coaches, all paid for through the British Boxer Indemnity. Completion of the Canton-Hankow Railway is one of the major projects in railway construction now going forward and with the difficult work over the middle section, 406 kilometers, in full progress the hope is held that the entire line, which has been in course of construction for a quarter of a century, will be completed by the end of next year.

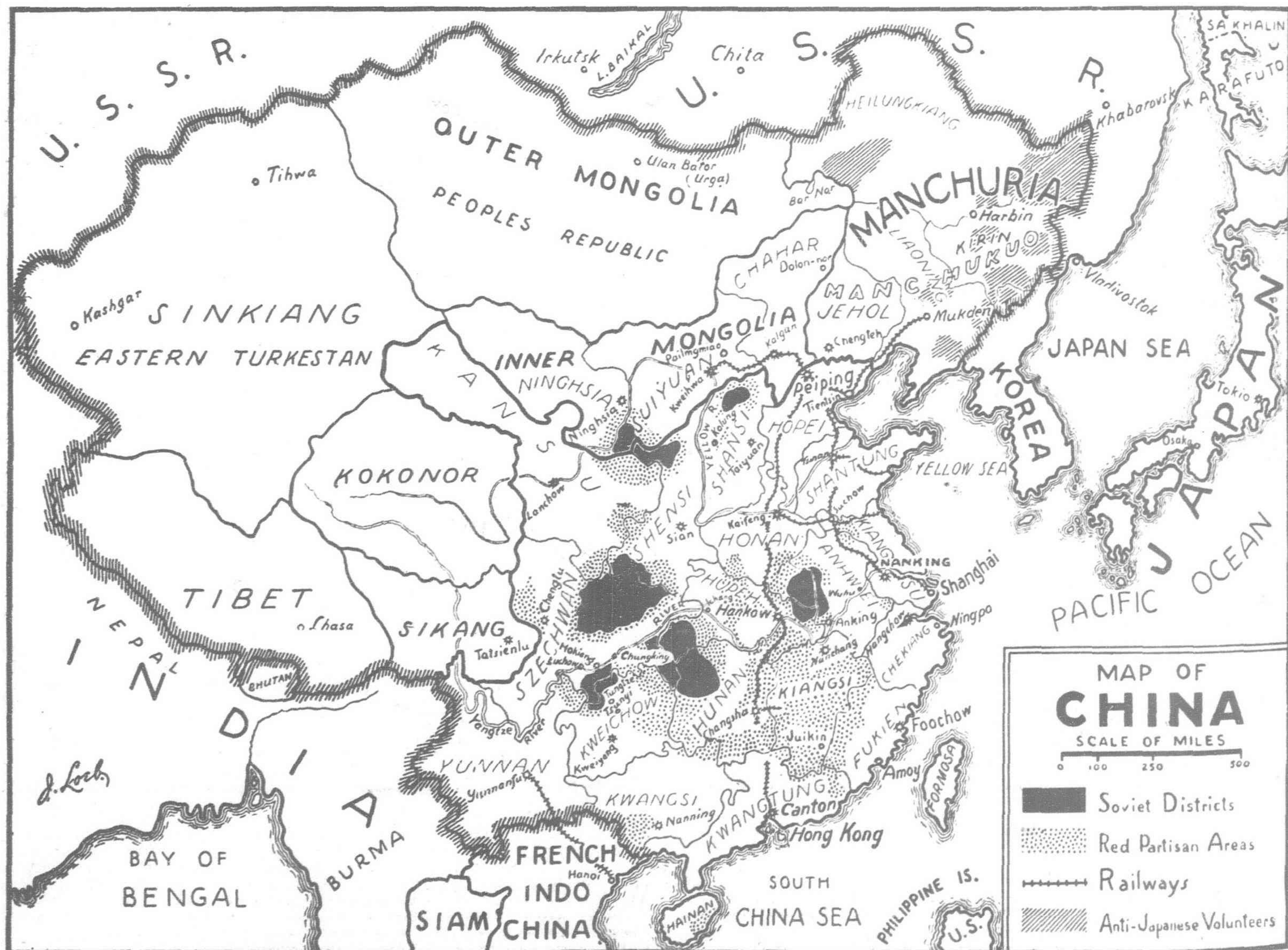
In the building of roads considerable progress in recent years is to be recorded, as a system of newly built highways now connects Shanghai, Hangchow, Wuhu and Nanking and from Wuhu a road runs to Nanchang and thence to Changsha, Capital of Hunan. Within the period since May, 1933, when the work of road building was placed in the hands of the National Economic Council under the Ministry of Railways, which has jurisdiction over all highways in China, communications by road have been extended through the provinces of Chekiang, Fukien, Kiangsu, Anhwei, Honan, Hupeh, Kiangsi and Hunan. According to authoritative record, recently published, a total of 6,149.7 li of roads has been completed while an additional 2,615.4 li are being built and 1,574 li are planned.

Vast strides in commercial aviation have also been made in recent years in China and all the principal centers of the country now are connected by regularly scheduled air services. Telephone, telegraph and radio services also have been greatly extended. All

of China's principal centers now have telephone services and long distance lines connect Nanking with Hangchow, Tientsin, Hankow and Shanghai. Telephone services also connect Peiping and Tientsin, Tientsin and Mukden, Tsinan and Tsingtao while the Nanchang-Foochow and Peiping-Chahar lines are new services in operation. Plans to establish telephone services in the provinces of Kiangsu, Chekiang, Anhwei, Honan, Shantung and Hopei are being pushed and more than three hundred districts in Kiangsu and Chekiang already are linked up. To a great extent telephone materials being used are of Chinese manufacture and factories for the production of telegraphic apparatus are planned. Active progress is being made also in the development of a domestic wireless telephone service with the purpose to provide connections with foreign countries. Only within recent months an agreement was signed between the Telephone Administration of the Ministry of Communications and the Shanghai Telephone Company providing for full interchange of long-distance telephone facilities within and without China and radio telephone equipment for sending and receiving stations has already been acquired by the Ministry of Communications. Supplementing the telephone services, adequate telegraphic services extend throughout China and connect the country with the outside world.

The Major Menace

These are merely random evidences of things achieved in China despite a terrible financial situation superimposed upon conditions growing out of a vast rural population reduced to the point of collapse in addition to other adverse elements. But these things give an indication of what the country might be able to do if the solace of peace and order were vouchsafed throughout the land and some small measure of comfort meted out to the toiling, suffering millions who till the soil and feed the nation. The major

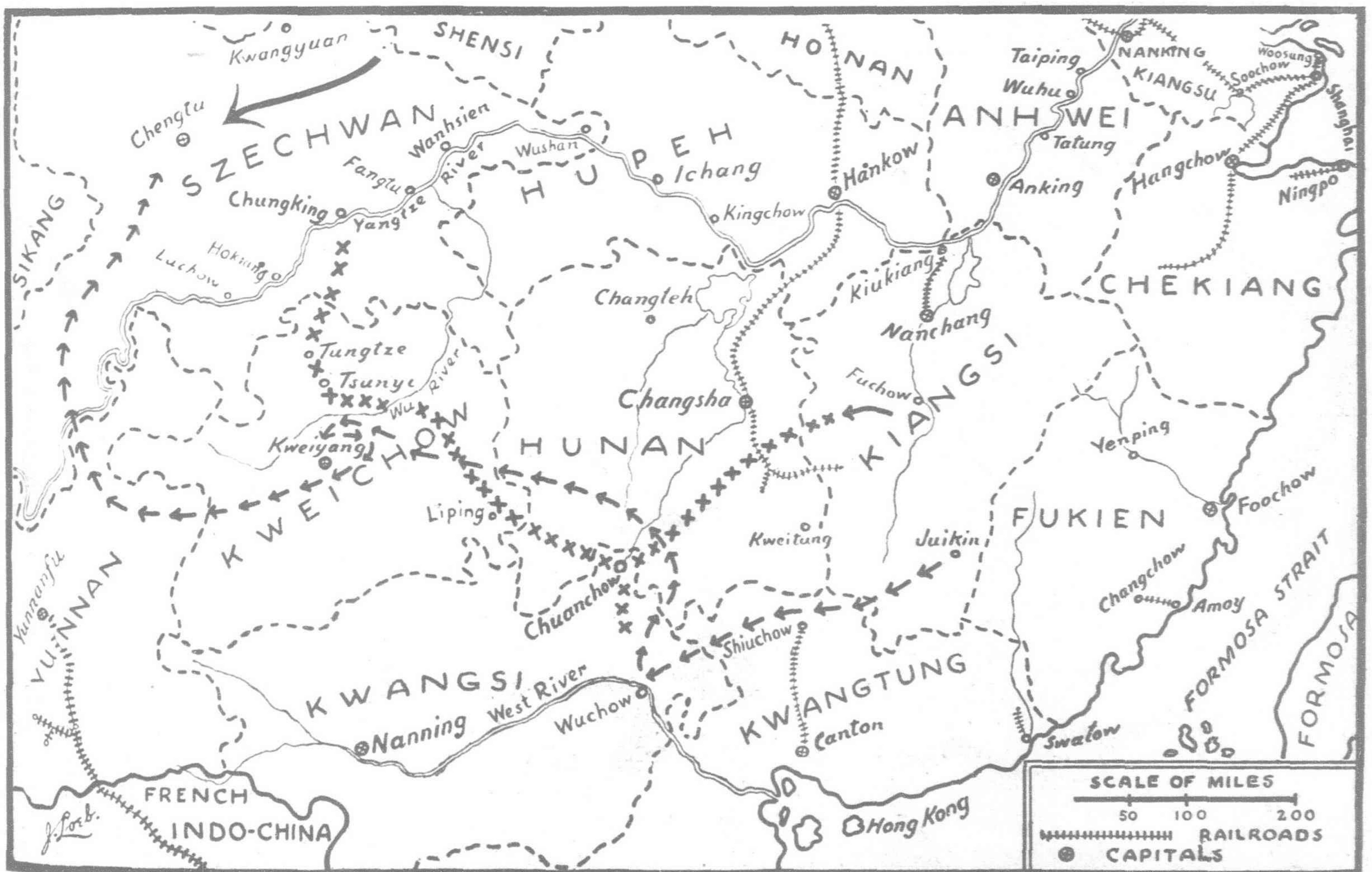


adverse factor in China and in the Far East, more serious far than the depression or the flight of silver from the country, which after all, are transitory ills, is the same thing that tore Europe wide open in past years and which as these lines are written forms the basis of an angered outburst addressed to Moscow by the American Government and other representations of similar character from Great Britain. The forces that have the frankly avowed purpose to overturn the established governments of the whole world have a firm footing to-day in the Far East and an exceedingly small shift in the course of affairs could result in converting China nominally at least into a Communist nation and a full-fledged member of the Soviet system. A large portion of the population proclaims this creed as its own to-day and supports its position with the rifles of a huge well-equipped military force. This is the real menace and this furnishes all the reason that is needed to explain what Japan has done and what she is doing, and it explains also the underlying causes of the new trend in China.

The so-called "Soviet Socialist Republic of China" extends its influence over a vast area which includes some of the richest and best land of the country. As the result of the many campaigns led by Chiang Kai-shek and the Nationalist armies through the past six years the main forces of the Communist armies and their followers, numbering perhaps a hundred thousand, have been thrust out of positions they so long occupied in Kiangsi and Fukien and in the past eight months have penetrated into the interior, retreating on a thousand-mile westward march into Szechuen, richest and most populous province in China whence contact may be established through Kansu with the Russian commanded communist forces of Mongolia. It is estimated that the Communist influence in China impinges upon the lives of a hundred million people over an area of 300,000 square miles. Exactly what the

total membership of the Chinese Communist party may be is not known and estimates vary from 80,000 to 300,000. Not all who apply are admitted and candidates for membership must pass through a period of probation and prove themselves under searching tests before they may become members of the party. It is not thought that many Russians remain in places of power in the governing body of the Chinese Soviet organization, a central executive committee, under which are seven ministries which direct the activities of district commissioners who in turn are in charge of an elaborate system of branches and departments that extend into all the principal centers of China, and in fact, throughout the Far East, as records in the Criminal Investigation Department of the Police of the International Settlement of Shanghai fully disclose.

Many astute Chinese leaders have embraced the Communist doctrines in recent years and their ranks have been swelled by disgruntled young intellectuals who have come under the sway of clever propagandists of the Third Internationale. Activities of Russian, American, British and German agents of the Communist party in China are surreptitious and for the most part are confined to the main centers of population. Through recent years the Sun Yat-sen Chinese Workers' University and the Stalin Eastern Workers' Communist University at Moscow, both endowed liberally by the Bolshevik Government, and both having Chinese student bodies of upward of a thousand, have been supplying the brains of the Communist movement through rural China, sending a steady stream of native agitators into the Far East possessed of the latest and most up-to-date training in Communistic precept and practice. Wherever the Red armies march in China a trail of carnage and devastation is left behind. All title deeds and landmarks are destroyed and the land is then distributed among the peasants from whom a fifth of what they produce is exacted by the new rulers.



—from "China To-day"

This map shows the directions taken by the main bodies of the Red Army in China on their thousand-mile westward march. One army (designated by crosses), commanded by Hsiao Keh, started from central Kiangsi province, and after marching through the provinces of northern Kwangsi, southern Hunan and Kweichow, approached Chungking, a large Yangtze river port in Szechuen province. When on its march this Army had reached Hunan province it was joined by Red troops under Ho Lung's command. The Army (designated by arrows) commanded by Mao Tse-tung, started from Juikin, Kiangsi province, marched through Kwangtung, eastern part of Kwangsi, Hunan, and Kweichow provinces. This Army encircled Kweichow, the capital of Kweichow province and continued its march westward, passing through Yunnan province to Szechuen province. It has already come within striking distance of Chengtu, capital of Szechuen. Large arrow in upper left corner indicates the direction of movement of Red Army, commanded by Hsu Hsiang-chien, which has approached Chengtu from Shensi province.

In the hey-day of their power in southern China with their capital of Juikin in Kiangsi, which was evacuated by the Red Army in the middle of last November, the communist authorities established banks and postal services, issuing postage stamps and Chinese Soviet currency.

This is the thing that has grown up in China to menace law-abiding, patriotic Chinese in their efforts to establish an orderly government and bring peace and prosperity to the land. The Nanking Government has employed scores of armies and poured out tens of millions in treasure to stem this Red tide which through the years has grown ever more menacing. The great powers of the western world are blissfully unconscious of this danger in the Far East. The Empire of Japan in the shadow of the menace cannot possibly afford to be ignorant of or to ignore it. Three hundred and sixty million Chinese toiling on the land and crushed under a yoke of high rents, pitifully low wages, exorbitant taxes, usurious interest on credit and unfair exploitation of dealers who handle their products provide an inexhaustible reservoir under present-day conditions from which the growing communist power may draw power and sustenance in ever increasing drafts.

The Force Behind Communism

This thrust of Communism into China assuredly has the full support of the Communist regime at Moscow and this means the backing of all the resources of the greatest military machine the world has ever seen. The Government of the Soviets in Russia has two great fronts to guard and the drift of world affairs in Europe and in the Far East undoubtedly explains the causes behind the announcement made early this year by Vice-Commissar of War Tukhachevsky that the strength of the Red army had been more than doubled in the year just closed, a peace time force of 940,000 men and a potential war strength of 8,000,000. The war budget was quadrupled to 6,500,000,000 roubles—equivalent at par to about Gold \$6,000,000,000.

Military experts give full credence to the statement made some months ago by Commissar of War Voroshilov that the huge Russian fighting machine was the most mechanized in the world, possessing eight horse power of motors per man, with this factor of mechanization carried to such an extent that while retaining the cavalry, it had been necessary to create new types of troop formation. There is little doubt that the Red army of Russia has the largest aviation force in the world, possessing approximately 3,500 planes in addition to 400 commercial planes that the Government owns with a personnel in the aviation forces estimated at 35,000 men of whom 6,000 are pilots. In the matter of tanks Soviet officials claim, with sound basis for the claim, that the strength in small tanks has been multiplied twenty-five times in the past four years and in this period heavy tanks have been multiplied eight times. Foreign experts believe the total to be about 1,500 tanks.

It is known that Russian zones on both of her fronts now are fortified with steel and concrete defenses. What Russia may do on her western front to guard against any possible thrusts from her ancient foe Poland or Rumania and from the newly created Baltic states of Lithuania, Latvia or Esthonia, or from Finland is of no immediate concern to Japan, China or to the Far East. Russian activities in Siberia, in Mongolia, in the states bordering western China and in China, however, are a cause of apprehension and alarm. In the alignment of the big Russian fighting machine it is known that the Soviet leaders long have purposed and in all likelihood have succeeded in making the Red Far Eastern army in Siberia "autonomous." This has been done by piling up immense quantities of munitions, armament and supplies of all kinds so that the Far Eastern army under General Galens may be enabled to go on fighting for a long period of time without depending upon the transport system which extends back over 4,000 miles to Moscow and admittedly is poor, the weakest link in the Russian armament chain. Along the border of Manchoukuo are fortresses of steel and concrete, huge military establishments fully mechanized and possessed of the most modern fighting equipment with tanks and adequate forces of airplanes housed in subterranean shelters, safe under steel and concrete from aerial attack, and at Vladivostok are submarines in number—how many has never been disclosed—that have been shipped to this port knocked down to be assembled when need arises to raid hostile coasts and shipping. Also at Vladivostok is the huge fleet of fighting airplanes and the great bombing planes prepared for that long heralded "one-way flight" of six hundred miles with the purpose to perish while destroying the great centers of population and industrial activity in Japan.

It is estimated that the Far Eastern Army of the Soviets has a numerical strength of 300,000 soldiers specially selected and inured to life in a primitive land and the Arctic cold of Siberian winters. While the production of iron and steel in Russia has been trebled in the past four years, under the ruthless requirements of the Five Year plans the great industrial establishments and chemical plants that the Soviet leaders have erected to supply the needs of their vast military organizations are most strategically located east and west of the Urals in the center of the U.S.S.R., completely beyond the range of any possible attack by present-day aircraft. In this particular also the Far Eastern Red Army is made self sufficient in its own sphere with a vast metallurgical establishment in the Kuznetsk coal basin 1,000 miles east of the Urals and the second Five Year plan calls for the creation of another iron and steel machine building center in the Far East to provide for needs of the Far Eastern Red Army.

Thus it may be that the "menace from the direction of Urga" at length may be taking definite form and those who ponder causes why Japan and China are acting in concert need seek no farther.

Dean Williams

By FRANK H. HEDGES

THE Far East has lost one of its staunchest and sanest friends with the passing of Dr. Walter Williams, founder and Dean of the first school of journalism in the world and recently resigned president of the University of Missouri. Although the Far East was never his home, Dr. Williams had made frequent trips to this part of the world during the past three decades and was as much "at home" here as if he had maintained a residence in Tokyo, Shanghai or Manila. In fact, Dr. Williams was at home in any country, for he had been an exchange professor in journalism in Europe, in Mexico and in South America, and had visited every country on the globe at least once. At the beginning of the century he was sent to more than two thousand newspapers throughout the world as the official representative of the Louisiana Purchase Exposition which was held in St. Louis.

But the Far East was peculiarly close to the heart of The Dean, as Dr. Williams was affectionately known. There are, of

course, hundreds of deans—probably thousands—in all lands, but when the term "The Dean" was used it meant to all who knew him but one man—Dean Walter Williams. Dean he was, not only of the School of Journalism of the University of Missouri but of world journalism. It is doubtful if there is a newspaper man anywhere who would gainsay him that title.

The Dean envisaged the growing importance of the Pacific area long before it was generally recognized, and strove to impart to the students under him an intelligent interest in its problems and its future. Graduate after graduate of his school journeyed to Japan, to China, to the Philippines to take part in journalistic activity. Some came to work on local newspapers or magazines and some came as correspondents for the American press and press agencies. Some were returning to their homelands after having received their bachelor's degree in journalism in the United States.

(Continued on page 301)

Plans for Tokyo of the Future*

A CITY of 10,000,000. That is Tokyo 50 years from to-day. And this prediction is probably a very conservative one. It is based on multiplication of the present yearly increase of 100,000 by 50 and adding the total to the present population of 5,000,000. It does not take into account the possibility of a steadily mounting yearly increase with the rapid industrial and commercial development of the city.

Dense as Tokyo's population is to-day—as dense as New York City with its 9,000 persons per square mile—how can this leading Japanese metropolis accommodate its future population? How can Tokyo of the future properly provide for the common welfare of its citizens? These and other equally important questions confront the city of Tokyo to-day as they do other leading and growing cities of the world. With these fundamental municipal problems in mind, it is laying its plans in order to direct growth along such lines as will not only maintain, but improve the manner of living for its growing population.

A description of how Tokyo came to be and grew to its present proportions is probably of lesser interest and importance than an explanation of what it actually is and where it is going. A brief historical review, however, will be of some value in understanding the manner in which the city developed as well as some of the problems which Tokyo forefathers created for the present generation.

Was Once Wilderness

A thousand years ago, the site of the city was a wilderness in a remote corner of eastern Japan when Kyoto and Nara were

flourishing as the centers of Japanese culture and civilization. Not until Do-kan Ota, a feudal warrior, built his castle in this wilderness four and a half centuries ago did Yedo, the forerunner of Tokyo, come to be. From a fishing hamlet, Yedo became a feudal stronghold and then a castle town under Ota's three decades of enlightened administration. Then, after his death, Yedo slackened and progressed no more for about a century until Iyeyasu, the first of the Tokugawa rulers, became lord of the eastern provinces (Kwanto) and selected the sleeping town for his capital. Under his efficient administration and under those of his successors—for two and a half centuries—Yedo developed and flourished. Streets were laid out, marshy lands reclaimed for building lots; water supplies created. As the Shogun's capital, Yedo became the center of a new culture.

But one of the biggest municipal problems of to-day originated in that period. There was no unified city planning—no systematic arrangement of streets and districts which would give orderly growth and development to the community. Yedo is said to have possessed, according to a haphazard count then given, 808 “cho,” or blocked districts, the number merely indicating that there were many such districts. A large proportion of these units did not have names, and the houses were not numbered. The streets were primarily laid out for strategic reasons, not as traffic arteries, and the map of Yedo, when modern administrators succeeded to the task of running the city's business under the new system promulgated with the establishment of Tokyo, presented a difficult jig-saw puzzle, baffling in the problems it presented.

**The Japan Advertiser*



An Air view of part of Nihombashi Ward showing the new Y.5,446,368 Tokyo Stock Exchange Buildings in foreground. Mitsubishi Warehouse on Yedo River is shown in center near Yedobashi (bridge). Nihombashi, or Bridge of Japan is at extreme left with Main Mitsukoshi Department Store and Mitsui Bank beyond

Following the Meiji Restoration in 1868, when the capital was removed from Kyoto to Yedo, and Yedo was renamed Tokyo, the city's phenomenal rise and progress began. But at the same time, municipal problems which were not problems to the Yedo rulers confronted the builders of the new national capital, and the problems were of such magnitude that the growth of population, which was rapid, forced the plans of orderly municipal growth farther away from the ideals. This tendency hindered the progress of city planning for many years.

1923 Fire Helpful

Disastrous on the one hand, yet the best solution to the problems of orderly and unified city planning, was the earthquake and fire of 1923. Reducing nearly one half of the former city proper to ashes in a single day, bringing death to uncounted thousands and resulting in loss in wealth of Y.3,700,000,000, the disaster was great. Out of it, however, came good—an opportunity for the city and its citizens to build a new metropolis along modern lines and to provide a direction to municipal growth calculated to enable the city to accomplish, during the several decades to come, many of its plans of systematic civic organization and unification with the ultimate objective of providing for the common welfare of the present and future populations.

Tokyo as it is to-day is really the accomplishment of only a decade of reconstruction, not only from the disaster, but also from Yedo traditions. And because of its rapid rise from its ruins into one of the leading cities of the world, has been called by some people a "phenomenon of the 20th century." But men of vision are seeking still further to make Tokyo a "more comfortable abode."

The plans and activities listed below which will eventually contribute to making this city more comfortable are by no means the last word. These plans, which have been mapped out by the City Planning Department, with the assistance of other official and public bodies interested in rational civic development, are, according to Mr. Noboru Tanigawa, chief of the department, "plans with a practical purpose." In view of the actualities—the rapid growth of populations and the consequent increase and development of industrial, commercial and other productive economic enterprises—Mr. Tanigawa prefers to stay close to earth instead of offering "dream plans" which are beautiful in theory but impossible in practice.

Graduate of Harvard

Mr. Tanigawa, a graduate of Harvard University, where he received instruction in the science of city administration and planning under several of the leading American authorities, has



Capitol Center of Future toward which Tokyo is now building

(1) The new Imperial Diet Building, the hub of the Empire's capital center now in the making. (2) The Library of Parliament in the center flanked by administrative buildings of the Diet, now under construction. (3) One of the sites for official residences of Governmental department chiefs. (4) The German Embassy. (5) The official residence of the Premier. (6) The Patent Bureau near Tameike. (7) Site for the official residence of the Foreign Minister. (8) The Cabinet Building under construction. (9) Building for the Board of Audit now under construction. (10) The Education Ministry. (11) Finance Ministry now under construction in the site of the old Russian Embassy. (12), (13) and (14) Present site of the Foreign Office and proposed site for the Commerce and Agricultural Ministries. (15) Proposed site for the new Foreign Office. (16) The Home Ministry. (17) The Metropolitan Police Board. (18) Site of the present Diet Building and proposed site for the Communications Ministry. (19) The Navy Ministry. (20) The Supreme Court. (21) The Justice Ministry. (22) The Tokyo District Court Houses. (23) The Overseas Ministry. (24) Present site of the Army General Staff and site for its new building. (25) Present site of the War Ministry and site for its new building. (Specially drawn for *The Japan Advertiser* by the City Planning Department).

been connected with Tokyo city planning since he completed his Harvard course in 1924. The plans set forth here are all being formulated or executed by Mr. Tanigawa's department.

The streets of a city may be compared to the veins and arteries of a human body, and they are of vital importance in providing a system of circulation to a city with a growing population. They are also the skeleton upon which depend systematic zoning, orderly traffic, efficiency, health, comfort and civic beauty. In the Tokugawa period, no consideration was given to these essentials, for the streets were mainly constructed for street fighting in time of emergencies. Though some of the chaotic conditions resulting from the lay-out of Yedo were decreased to an appreciable extent by early Tokyo administrators, the really revolutionary changes occurred after the 1923 disaster.

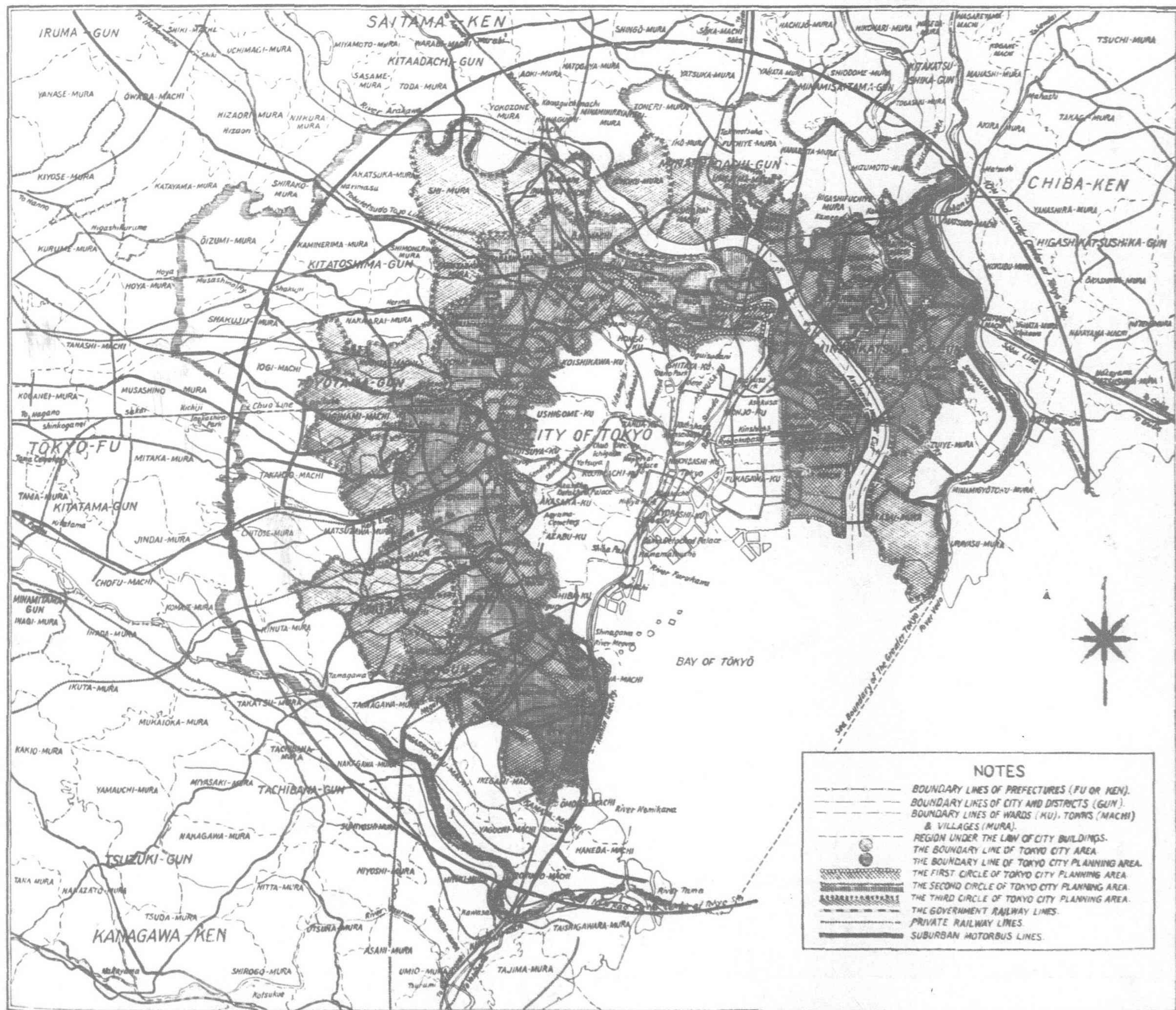
The vast area demolished by fire that year now possesses well-ordered streets, the construction of which was completed a few years ago, thus doing away with one of the most undesirable remnants of old Yedo. The present streets of Tokyo, which are divided into three categories—State, prefectural and municipal—have a total length of about 7,000 kilometers (4,347 miles) and a total area of 37,000,000 square meters, about one half of which is paved. In creating and paving these streets more than Y.603,000,000 has been spent, and about Y.350,000,000 more is to be expended on plans already authorized.

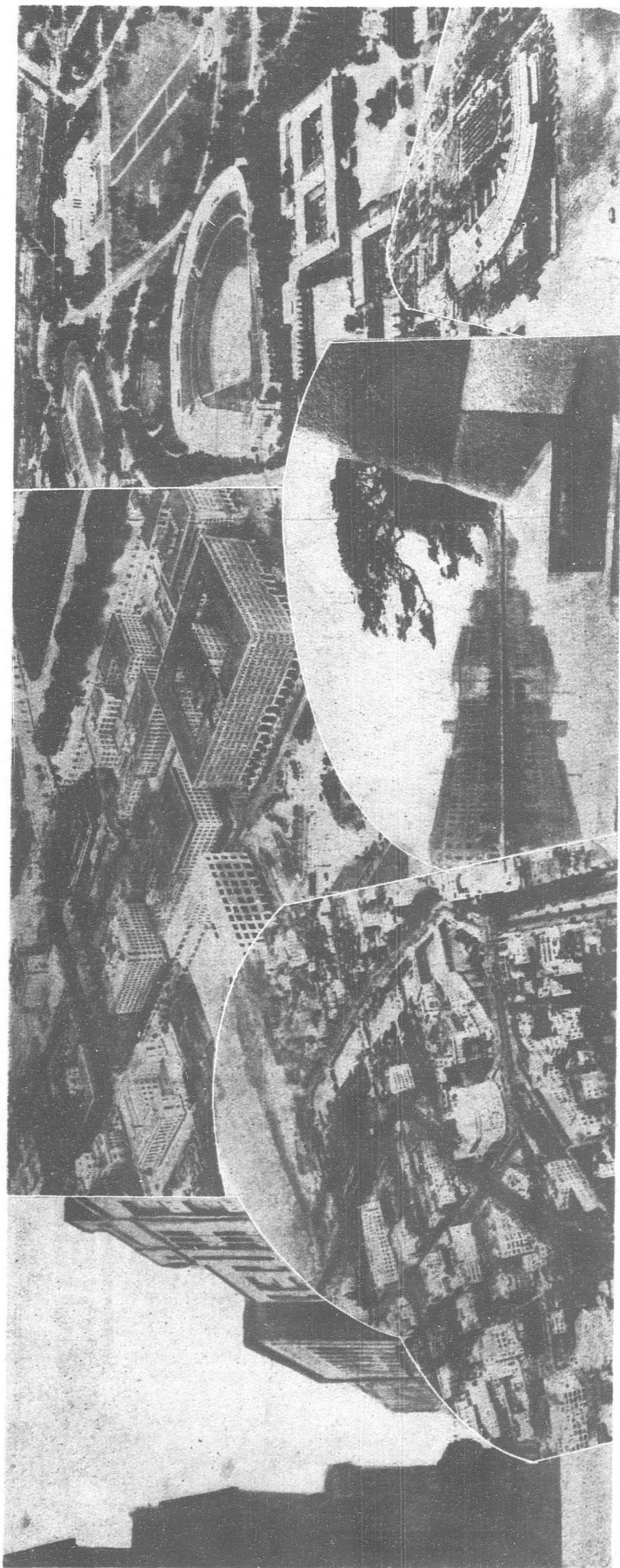
Traditions Prove Obstacle

Although the skeleton of the city, covering 553 square kilometers, is still incomplete, the district which was devastated in 1923 has been organized systematically, and the various sections have been blocked out uniformly. And this has been accomplished in such highly populated wards as Kojimachi, Kyobashi, Nihonbashi, Shitaya, Asakusa, Honjo and Fukagawa. To accomplish this much, it took the city planners a decade, not only to lay out and organize the districts, but to fight against traditions—against old-time residents of certain blocked off units who were unwilling to merge with other units in order to contribute to uniformity because of their devotion to the traditions and names of the blocked units with which they had always been identified. As these men were organized into powerful local units in the municipal administration, the campaign was a difficult one and will probably be as difficult in the remaining unorganized areas unless the citizens are further educated in the principles of civic development. Eighty per cent of the work has thus far been accomplished.

Tokyo is divided into 35 wards, and it aims ultimately to have each of the wards uniformly sectioned into blocked units or "cho" and these again sectioned by numbers into several "chome." The plan seeks further to divide the latter sub-units by streets or foot-paths and section off each "chome" or sub-units into lesser units by "banchi" or a group of several houses bearing the same house

THE ADMINISTRATIVE BOUNDARIES WITHIN THE TOKYO CITY PLANNING AREA





Showing results of early steps toward beautifying Tokyo

Left, a modern business street in the Marunouchi district showing uniformity of building construction and absence of overhead street wiring for beautification purposes. Upper right, the Marunouchi business district seen from the Tokyo Station. Lower right, the Marunouchi business district, the heart of the city's commercial activities, seen from the air. Lower center, the Marunouchi business street along the outer moat of the Imperial Palace, showing achievements in beautification. Lower right, a bird's eye view of the capital's food exchange, the new Municipal Wholesale Market in Tsukiji. (Pictures by courtesy of the Tokyo Municipal Information Office and Japan Tourist Bureau.)

number. These are numbered in such a way as to keep all "banchi" units bearing even numbers on one side of a road and the odd numbers on the other. Finally each house in the "banchi" unit is designated by one, two, three and so on. When this plan has been adopted throughout the city, the address of a house will read, for example, as follows: 1 of No. 3, 4 chome, Aoyama. Akasaka Ward, which in Japanese reads in the reverse order, Akasaka-ku, Aoyama 4-chome, 3 banchi, 1 go.

Foreign System Unfeasible

The street and address system used in the United States is unfeasible in Tokyo because of the different layout of the city and different mode of living of the people. Many houses are more or less grouped into blocks remote from regular streets and do not face streets. Officially there is no Ginza Street or any other street.

After the layout of the city's web of streets comes the question of zoning for various purposes. Since Tokyo was enlarged to its present size with the amalgamation of 82 neighboring towns and villages three years ago, it has become the nation's center of production and consumption, with an annual industrial production worth more than Y.1,000,000,000. The development of the city as an industrial and commercial metropolis has necessitated zoning in such a way as to provide efficiency, health and comfort to citizens in their hours of work as well as to their hours of play.

The capital has thus been zoned into four district—residential, commercial, industrial and undetermined—each with regulations governing its architecture, activities and development.

The residential district allow the existence of small retail shops and home industries but will not allow machine industries, factory chimneys which pollute the atmosphere with smoke, warehouses, large theaters, dumps and buildings more than 20 meters (65.6) in height. The districts designated as residential will be maintained and preserved as such for the peace, comfort and health of the citizens. The residential districts cover the largest area, with more than 220,000 square kilometers and comprise the following wards: Kojimachi, Azabu, Akasaka, Yotsuya, Ushigome, Koishikawa, Hongo, Omori, Meguro, Ebara, Shibuya, Yodobashi, Nakano, Toshima, Itabashi. Parts of other wards are also so designated. Scenic considerations were taken into consideration when the zones were fixed.

Commerce Given Area

Commercial districts have been allotted to those sections of the city where transportation and communication facilities are systematized and concentrated. Industries using high-powered machinery and smokestacks are prohibited, but commercial establishments which are prohibited in residential quarters are permitted. The area allotted to commercial centers totalled about 48,000 square kilometers at the end of last year, comprising the following wards: Kyobashi, Nihonbashi, Kanda, Shiba, Asakusa, Shitaya, Shinjuku, Otsuka, Sugamo and Shinagawa. A section of Shibuya is also commercial.

Industrial districts were allotted to certain areas advantageous from the standpoint of transportation and where industrial establishments would not harm the interests of the two foregoing zones. Special sections have been assigned in these districts to chemical, explosive and petroleum industries. The industrial areas total about 130,500 square kilometers to date and are located in Honjo, Fukagawa, Mukojima, Arakawa, Joto, Yedogawa, Katsushika, Adachi, Oji, the Shibaura reclaimed land, Shinagawa, Omori, Rokugo and Kamata.

Areas which are undetermined cover more than 7,000 square kilometers, and the city is at present making a thorough investigation of them to find out for

what they are best suited. Permitted in them at present are mainly light industries. They are in Tsukishima (part of Kyobashi), the Shibaura reclaimed land, Shinagawa, Osaki, Meguro, Ochiai, Takata, Totsuka, Nippori, Honjo and Fukagawa.

The zones named above are not absolute, but the underlying principles are gradually being carried out that will eventually make them exclusively residential, commercial and industrial.

More Beauty Planned

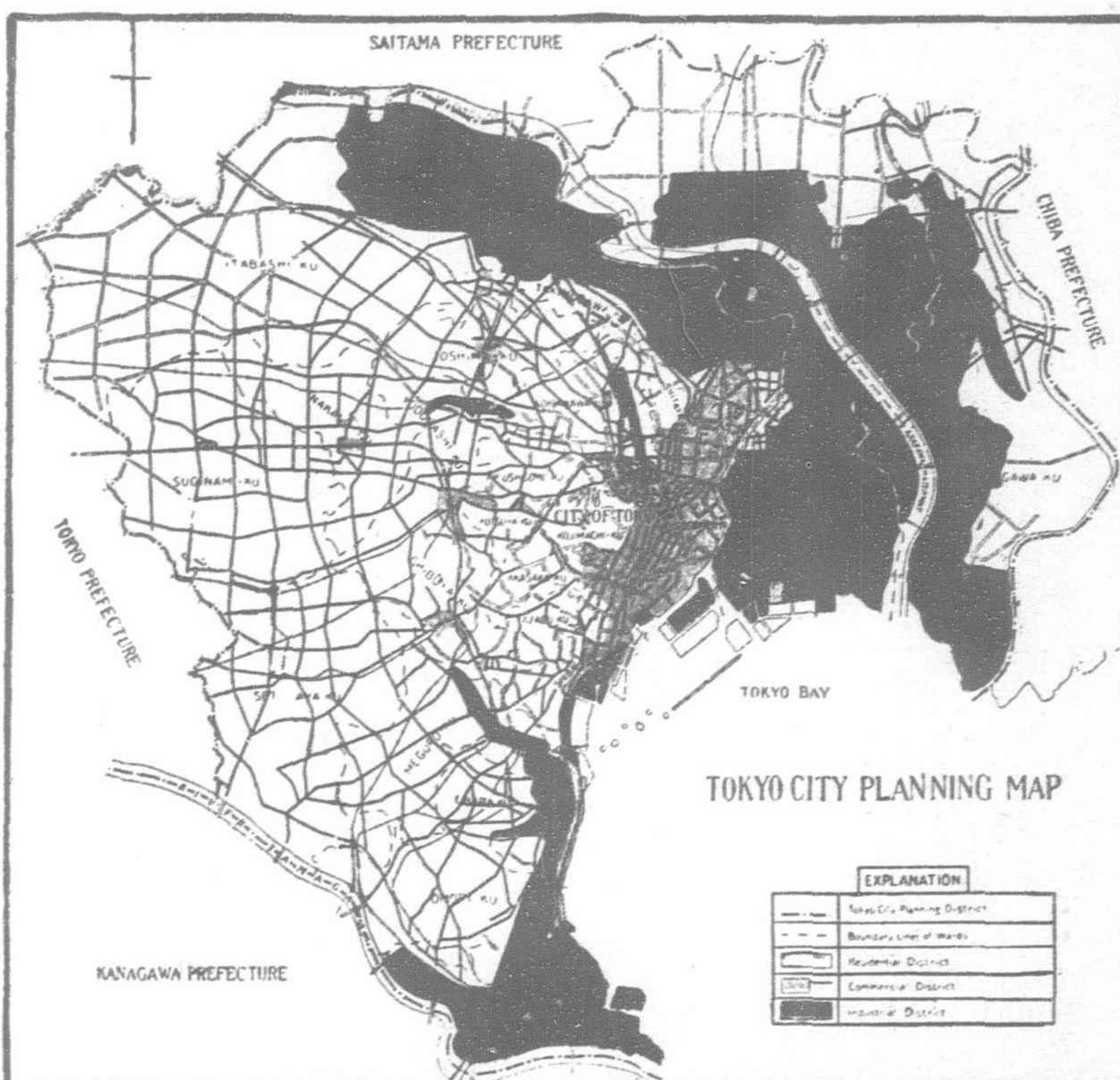
The next step to be considered, probably the most interesting, because of the ideals it involves is beautification. This artistic phase of the city's enterprises presents a project of great value to both the citizens of to-day and those of to-morrow. Cultural surroundings, mental and physical health and aesthetic appreciation, all of which make for greater human progress, depend upon the development of a city beautiful.

Technically, beautification, preservation of green spaces or natural landscapes and creation and maintenance of cultural and recreational centers may fall under different public enterprises, but here it is well to consider them all under beautification. It must be mentioned in passing that as fire has always been a menace to those who live in wooden houses in congested areas, laws have been passed in Tokyo regulating, according to districts, the construction of buildings. Attention is paid to prevention of fire, architectural suitability. Fireproof zones have been designated into two classes, namely, A, which must have buildings of reinforced concrete or brick, and B, in which wooden buildings are allowed provided designated portions are fireproof. The fireproof area of the city is about 6,000,000 square meters at present.

At the same time designated landscape districts are being preserved and improved. Outstanding is that around the Imperial Palace, which includes the Marunouchi business district, with its modern structures, Hibiya Park, the hills of Kasumigaseki, where the new Diet building is nearing completion, and the Diet environs. It continues, via the German Embassy, around the rear of the Palace to the 1st and 2nd Infantry Regiments of the Imperial Guards and Kudan Hill.

Wires to be Removed

Beautification plans in this large district—unique because of the contrast between the hub, which is the Imperial Palace, re-



City Zoning and Transportation

The black areas on the upper map indicate the exclusively industrial districts in Tokyo; the shaded areas are zoned for commercial districts; and the white areas are principally restricted as residential districts. (Map prepared by the City Planning Department).

The white space on the lower map indicates the projected Shinjuku Terminal where all transport systems, including the Government railways, the municipal tramway, the urban and suburban bus lines, taxis and the projected underground railway to Tokyo Station will be co-ordinated. The arms indicate paved streets from the plaza. Subway passage will connect the various transport systems. The dotted area is reserved for buildings. The present Shinjuku Station is the small dark area to the right of the railway lines.

presenting a beauty of old Japan, and the modern construction surrounding it—will eventually call for removal of telephone poles, with all wires laid underground. The outer Palace gardens will be improved in landscape, because the Palace is the spiritual center of the nation, where millions call during the year to pay homage to the Emperor at the Nijubashi entrance. Future construction in the Marunouchi district must conform with architectural beauty, and the canal spanned by such bridges as Kanda-bashi, Gofukubashi, Kajibashi, Suki-yabashi and Yamashitabashi will be cleansed and parkways created. The canal is one of the boundaries of the scenic center.

What is looked forward to with special interest and will later be admired by all subjects of the Empire is the coming capital center. On what may be called Japanese Capitol Hill, the new Diet is nearing completion. An adjoining building, in which business offices and a library will be housed, is under construction. Surrounding the Diet building, the Metropolitan Police Board, the Home Ministry, the Education Ministry and the Patent Bureau have already been established in new buildings. The other Ministries will be torn down and on their sites will be erected the War Office, the Army General Staff Building, the Cabinet Building, the Commerce Ministry, the Agricultural Ministry, the Foreign Office, the Communications Ministry and numerous official residences of Cabinet Ministers, bureau chiefs, the President of the House of Peers and the Speaker of the Lower House. On the site of the old Russian Embassy, the Finance Ministry is now in process of construction. The brick building of the Justice Ministry and the Navy Office will be replaced later.

Complete in Six Years

This capital center will be fully completed within six years, according to Mr. Tanigawa and when it is it will fulfil the dream of many men living and dead who have

looked forward to its establishment. This is the coming center of the nation's administrative activities.

Much of the natural beauty of the plains of Musashi, on which Tokyo has been established has been disappearing, especially in the suburbs, because of the rapid increase in population and the building of houses without any consideration for the preservation of natural landscape. Although there are no regulations governing this, leading citizens are cognizant of the importance of preserving green space as recreational grounds for the increasing population, Mr. Tanigawa said, and a committee composed of official

representatives of Tokyo City, Tokyo, Saitama, Chiba and Kanagawa prefectures, the Railway Ministry and the Police Board are campaigning for greater public interest in the value of open space from the standpoint of recreation, health and preservation of civic beauty.

What Tokyo lacks to-day is a civic center. Although the design and plans for a Y.10,000,000 city hall have been made, where it will be established is still undecided. Nor has the money been appropriated for its construction. But Mr. Tanigawa is deeply conscious of the need of an organized civic center around the proposed city hall, with a civic auditorium, a city library and other public buildings. "The civic center will eventually come, and in the near future," the chief city planner declared hopefully.

The greatest sports center in the world, if completed, will be that recently announced in the campaign to induce the nations to select Tokyo as the site for the 1940 Olympic Games. There will be numerous small stadia around the central stadium, with a seating capacity of 150,000, the largest in the world. The center may be established in Tsukishima the reclaimed land at the mouth of the Sumida River, although the location has not been selected definitely. Aside from its connection with the Olympic campaign, the plan for this sports forum seeks to promote the welfare of Tokyo citizens through the creation of sports facilities. Work on the enterprise will begin when Japan's bid for the Olympic Games is accepted, it is understood.

Tokyo's Big Traffic Problem

If left to itself, unregulated and unassisted, Tokyo's traffic—growing in vehicular and passenger volume from year to year—might be forced to a virtual standstill when its increasing population nears the saturation point several decades from now. Traffic jams and serious congestion will stop the flow of the population, and community health will be endangered.

This growing traffic menace is considered by Mr. Noboru Tanigawa, head of the City Planning Department, to be one of the greatest municipal problems of the day—problems having possibilities of getting out of control if not given adequate consideration now. As the streets of a city are like the veins and arteries of the human body, especially if one includes under the designation street not only the open right of way but the subways that run underneath it and the elevated railroads that run above it, they are of paramount importance as organs of circulation. So long as this circulation functions properly the community will be healthy.

A Problem 2,000 Years Ago

Ever since there were cities and streets, street congestion has probably existed. The deep ruts worn by chariots in the narrow thoroughfares of Pompeii are part of the evidence, we are told, that it puzzled the brains of the Romans 2,000 years ago. In medieval cities it was aggravated by the narrowness of the alleys which passed for thoroughfares, and by total absence of paving. It has been said that one of the irritations behind the French Revolution was the number of street accidents caused by the reckless driving of the nobility. Tokyo's predecessor, Yedo, with its narrow, crooked streets and large population was no doubt aware of traffic problems and congestion. And Tokyo inherited some of the basic evils of its present problems from Yedo.

The troublesome traffic situation of old was caused in part by the slowness and clumsiness of the vehicles then used, and the scarcity of vehicles in proportion to population. Congestion of modern city streets come from wholly different causes—modern means of transportation such as automobiles, buses, trucks, tram-cars, and, in Tokyo, bicycles. If many more of these vehicles were dumped on Tokyo's present layout of streets, the result would be paralysis. It might even be impossible for the vehicle to live up to the part of its definition which says it shall be movable. If we regard the street as a container into which traffic is poured we observe that it is like any other container—it will hold so much and no more.

Modern traffic in Tokyo is of recent origin. Until some years ago, due partly to a scarcity of gasoline-driven vehicles but chiefly to the fact that a large body of the population lived in or near its places of business, traffic movement of the modern type was not as severe a problem as it is to-day. Congestion of course existed—probably greater congestion than to-day. Then the city had this

situation solved for it to a great extent by the disaster in 1923 which remade the map of Tokyo through reconstruction of orderly streets providing smoother channels through which traffic can flow. Due, however, to improvements in means of transportation and development of rapid transit, greater and greater numbers of the people are establishing homes in districts distant from their places of business or employment, and commuting has become the ordinary thing. The development and progress made by Tokyo as the center of Japan have not only contributed to the increase of passenger traffic, but also to the traffic in freight. The traffic problem which exists to-day requires, therefore, proper systematization and regulation of passenger and freight traffic.

What is the situation in Tokyo and what is being done to meet it?

How Millions Move

Glance a moment at transportation mechanism of Tokyo to-day. The city's millions are getting from place to place on the following systems: municipal tramways, government railways, subway, private railways, motor buses and taxicabs. The total capital investment of all the systems is about Y.600,000,000, and total number of passengers carried daily comes to about 3,500,000 persons, while the annual total is about 1,200,000,000.

Considered separately, the municipal tramway system has a total investment of Y.203,000,000, employs 1,350 cars, runs over 173 kilometers of rail and carries over 800,000 fares per day. It is interesting to note that this system has been rapidly declining in fares since 1924, when the peak was above 1,300,000.

The government railway (elevated) within the city limits has a total investment of Y.77,000,000, employs about 900 cars, runs over nearly 90 kilometers of rail and carries 900,000 passengers daily. This enterprise shows a rise in the number of fares carried, which has been increasing steadily from a half million in 1924.

The one subway line in the city, managed by the Tokyo Underground Railway Company, from Asakusa to Shimbashi, has a total investment of Y.40,000,000 and carries about 150,000 fares daily. Together with two other lines projected in the city the subway system has a distinct transportation service to offer as the most rapid system.

Private railways operating largely in suburban districts by 14 different companies have a total investment of about Y.260,000,000, employ 1,000 cars, run over 220 kilometers of rail and carry almost 600,000 passengers daily. This system has shown a steady increase, doubling the number of passengers within a decade. The distinct function of private lines is to connect the suburban areas with the heart of the city.

Private buses are operated by about 50 different companies with a total investment of almost Y.23,000,000. Operating about 2,000 buses over nearly 700 kilometers of roads and streets, this system has increased in the number of passengers carried daily from 100,000 in 1924 to 500,000 in 1934.

Taxicab a Factor

Probably the greatest single contributor to Tokyo's traffic bugbear is the taxicab. Numbering 12,000 in all because—a law limits them to that number—they are operated by about 2,800 different private companies. From 50,000 passengers carried a decade ago the taxi cab "system" (with really no system at all) now carries over a half million daily. About 10,000 of them operate 24 hours a day, the drivers working on about an eight-hour shift. On holidays taxis do a flourishing business and carry almost 1,000,000 fares. The total investment in this "system" is about Y.22,600,000, and the number of kilometers taxicabs traverse daily is incomputable. All that is known that their advent into the streets of Tokyo has produced a menacing traffic situation, a problem in road maintenance and a problem for the tramway system, which is operating at a deficit, as well as for the bus lines, which are barely making the grade or are operating at a deficit.

In order to alleviate the situation created by the taxi as an institution, a movement is gaining headway to reorganize the cab business on a new basis, in certain aspects similar to those in America. The establishment of taxi parking stations in congested business quarters such as the Ginza, Asakusa, Ueno and Shinjuku, and the limitation of taxis to 12,000 have solved but a small portion of the traffic situation, for the flow of taxi traffic is still to be regulated adequately.

A means considered by the City Planning Department to meet the heavy traffic flow over the boulevard in the outer gardens of the Imperial Palace is the construction of a motor subway from the Overseas Ministry to Otemon, a distance of about 800 meters. Motor traffic in itself is not the problem there, but rather preservation of peace around the palace and maintenance of safety for the thousands who go to the Nijubashi entrance to pay their respects to the Imperial House.

Big Plan for Shinjuku

City planners are now on the threshold of a gigantic project to connect all the transport systems of the city with a view to regulating traffic systematically and to further the principles of rapid transit.

This scheme is being instituted around Shinjuku Station, one of the centers of greatest vehicular and pedestrian traffic and of congestion. A general transport terminal will be established in a plaza close by the Shinjuku Station where a future subway line from the suburbs and another future subway line connecting Shinjuku with the Tokyo Station will meet. The motorbus lines from the heart of the city and from the suburban districts will also terminate here, while the elevated railways will also be connected in order to include and co-ordinate all the transport systems. The various systems will be connected with subterranean walks to ensure safety, and parking zones will be created for taxicabs. The plan for the Shinjuku terminal, which has already begun, will cost Y.3,600,000.

The importance of this terminal is paramount, because Shinjuku is not only one of the business centers through which suburban traffic flows into the city but also one of the gateways to the city from outlying Prefectures, and is the terminus of the State railway.

Following that in Shinjuku similar terminals will be constructed in Shibuya, where the scheme will cost over Y.4,000,000, Otsuka, Ikebukuro, Gotanda and other stations and minor commercial centers where all suburban bus and railway lines meet with the government railways, municipal tram lines and intra-urban bus systems. At the present time all these various systems are not sufficiently co-ordinated to insure rapid transit. The increasing population with the subsequent increase in traffic requires the complete co-ordination of these systems which will be capable of accommodating passengers as well as improving the rapidity and efficiency of transportation.

Ideal City is Practical

An ideal city is not simply a pretty design laid out on a map. It is also a device for getting things done—work, so that the people will not starve; play, so that they will live a normal and well rounded life. Tokyo as a business and industrial metropolis must carry its citizens to and from work, and in this respect rapid transportation is a necessity. With improvement in the standard of living and in the means of communication, larger and larger numbers of the people seek recreation not only within but outside of the city. Although this pleasure traffic rises and falls according to the day of the week and by the season, its regulation is of serious importance, because the traffic is considerably greater than that of working days.

Of no little importance to the improvement of traffic and traffic ways is the problem of freight transportation. Upon it depend the business of the city and the food supply for the citizens. In this respect city planners are devoting a great deal of time and money to improvement of harbor facilities and inland waterways such as rivers and canals. There are 185 rivers and canals in Tokyo with an aggregate length of 410,000 meters, covering an area of 18,729,000 square meters. In dredging and improving them the city has already spent about Y.50,000,000 and expects to spend many more millions in the future in order to make these channels of transportation efficient means of carrying commodities from place to place. Plans also are being made to cleanse the water in the canals and to regulate the flow by connecting them with the flow of rivers. The problem of procuring cleaner water for the canals first requires, however, the complete installation of a modern sewage system which will take all the rain, waste and sewage of the city through subterranean courses into disposal districts. Within the next decade the city will spend over Y.100,000,000 in installing sewage lines. Over 1,500 kilometers have been laid within the past two decades.

TOKYO HARBOR.—Entrance to the nation's biggest city will eventually allow 6,000 ton ships to load or unload along the quay.

At present there is 1,450 square kilometers of anchorage area capable of accommodating 50 ships of more than 3,000 tons, but the facilities existing now are inadequate to the needs of the city. The project now being carried on is part of a 10 year plan adopted in 1930 for which Y.33,000,000 has been authorized. The plan is to increase the loading capacity of the water front to 7,500,000 tons annually, to dredge the harbor to accommodate 80 vessels of less than 6,000 tons in the harbor, and to construct quays, landing places, parking places for barges and tugs, as well as roads, bridges, railways, warehouses and reclaimed grounds totalling 6,570,000 square meters. The harbor's completion will mean that Tokyo will have one of the finest harbors in the world.

Dean Williams

(Continued from page 294)

for it is a rare year indeed when the enrollment of the Missouri School of Journalism does not list a number of Far Eastern born students. During the academic year just closed, there were five Chinese, two Japanese and one Filipino student in that institution. Moreover, the Department of Journalism at Yenching University is directly connected with the Missouri school and is largely financed by the Missouri-Yenching Foundation. A story published in the Missouri School's paper last year, written by a graduate of St. John's University in Shanghai, was entitled "When the Tiger Roars in China," the tiger being the mascot-emblem of Missouri University. The story devoted a paragraph to some of the principal Missouri journalists now actively engaged in their profession in China, and it took more than a column to tell the tale. Most of them were native Chinese, but the list also contained some of the representative American correspondents and newspaper workers in this country. During the past twenty years approximately a hundred M. U. journalism graduates have worked in Japan, China or the Philippines, and through each of them The Dean has reached out and extended his influence for good.

That it was an influence for good can not be questioned. The Dean was a believer in friendship among nations and peoples, but he was no soft-hearted pacifist nor was he the type of after-dinner speaker who stands on his feet only to let platitudinous plaudits for this or that nation flow from his lips. He held that friendship among nations must be based on solid and enduring understanding and interests, and he held equally that no other member of the human race could play so great a part in bringing this about as the honest and able journalist.

The Dean was without prejudice. He knew and loved his China and his Chinese, but he also knew and loved the lands and the people of the Japanese Empire and of the Philippines. All too many foreigners in Japan can see no good in China, and probably an even greater number of the American and European dwellers in this land envision all Japanese as having a tail and two horns. So narrow a vision is not only foolish but is foolhardy and dangerous. Objections and criticism regarding both China and Japan are justified on many counts, but when the complete picture of either nation is seen much will be found worthy of respect and admiration on both sides of the China Sea. The Dean was broad-visioned enough to perceive this, and was able to impart his breadth of view to most of the students who had come under his instruction.

He was twice approached with the offer of the American Minister-ship to China and twice declined, just as he had declined an assistant Secretaryship of State. He felt that his greatest service could be given through his two chosen fields of journalism and education, and from this he never deviated. That The Dean was loved and appreciated by the Far East was demonstrated each time he visited this part of the world. Few foreigners have ever received so royal a welcome as was according him as he returned again and again.

The Dean has set in motion an ever-increasing growth of world-understanding of the Far East and its problems that will go on and on. It will go on through the personal efforts he exerted himself, and it will go on through all the Missouri journalists whom he taught and who are now, or have been in the past, active in the three great Far Eastern lands. The Far East has lost a true and sane friend with his passing, but it can not be counted all loss for this very reason. Truly the words that Lord Alfred Tennyson put into the mouth of Ulysses may be said of The Dean that "I am become a part of all that I have met."

Some Tin Deposits of the Burma-Malayan Peninsula

By S. H. HARMAN, A.I.M.M.

THE provocative want of finality so often apparent in attempts to define the genesis of many ore deposits and the impossibility of classifying such occurrences as either *in situ* or alluvially derived partly explains the contradictions that have developed in the literature concerning the tinfields of Malaya. The Gopeng Beds* furnished one example. The complex natural history of the well-known deposits of the Kinta valley, variously described as occurrences *in situ*† or of an alluvial‡ nature, has given rise to much controversy. Paradoxical though it may seem, the exploitation of numerous primary occurrences, mainly comprising igneous rock, is to-day largely carried out by dredge or gravel-pump methods.

Again, although no positive evidence supports it, there is a popularly held opinion that cassiterite, owing to its hardness, may be transported a matter of miles from its primary occurrence. The writer was led to question this view while conducting an investigation for tin deposits suspected to be lying under the sea. The information obtained from bore-holes sunk at sea and from an adjoining estuary afforded proof that the water-worn "free" cassiterite recovered had travelled very materially less than one mile, under unusually favorable conditions, and the appearance of "wear" was clearly evident in the crystals of 75 per cent Sn. purity within 100 yards migration from the parent rock. The rainfall in five consecutive months in the area in question averages 170-in. annually, while there are four knot tides, rising and falling 18-ft., the ebb tide affording the "drag"—potent physical forces that augment the transporting capacity of this estuary, the drainage channel since the last tectonic epoch.

These two important facts—the short distance that tin can be carried by water and the simulation of alluvially derived deposits by occurrences that are actually *in situ*—early impressed the writer in the course of his work on tin deposits in the Far East. In the present paper he proposes to describe certain occurrences of cassiterite in Burma and to point out certain features that these deposits have in common with those in other parts of the world.

The northern extension of the Malayan tin metallogenetic province that extends through Siam to Burma embraces stratigraphical and physiographical features that are common with those of the southern areas. Where cassiterite has been mined in the foothills flanking the main mountain ranges minor igneous intrusions, often laccolitic in type, and hogback hills of slight elevation are present. This topographical feature has persuaded the author of the advisability of investigating dome-like structures, which he regards as nature's monuments marking favorable country for wide-scale tin prospecting. To point to a specific example. Near Palaw village, in the Mergui district of Burma ($13^{\circ} 1' : 98^{\circ} 43'$), an inconspicuous tin-bearing intrusion (in plan showing elliptical boundaries) has been worked for a number of years. The cassiterite is contained by the margin of the intrusion, which appears to be a laccolite approximately 1,300-ft. long by 1,000-ft. wide and which at the summit is only 35-ft. above the surrounding plain. The deepest open-cast working is 40-ft., difficulties resulting from seepage water preventing deeper work. On the laccolite patches of metamorphosed sedimentary rock remain covering the igneous

mass, which appears to be formed of pegmatite and aplite, often kaolinized, and which is traversed by white and grey quartz veins. All but the grey quartz veins are highly, but sporadically, mineralized. Tourmalinization adjacent to the pegmatite is excessive. The feldspar has changed to kaolin without sericitization. Both cassiterite and tourmaline are fractured and filled with subsequent kaolin. No true crystal outlines of cassiterite were seen and a few specimens powdered under finger pressure, an unusual condition, yet not confined to this one particular occurrence. The recovered concentrates on assay gave 68 per cent Sn., of which about 50 per cent was plus No. 10 (I.M.M.) screen.

Tin mineral values on the laccolite are available at grass roots, a working face 35-ft. deep affording a clear section of the igneous mass. Adjoining this face a bore-hole was sunk 45-ft., making a total of 80-ft. below the present undisturbed surface. The bore-hole was entirely in igneous rock, with aplite for the last 21-ft. No sulphides were seen, but grains of a green colored mineral, probably scorodite, occurred in minor quantities. Extended boring operations determined aplite to be the core of the laccolite, in which low tin mineral values were constant to the depth where hand-boring was suspended, although the igneous mass was still sufficiently decomposed for further sinking.

An investigation was then made of the surrounding detrital plain, away from the igneous mass. Within a few feet of depth the underlying sedimentary rock was struck, which, owing to its hardness, precluded further hand boring. The accessory mineral in the detrital was marcasite, with tin values only when in close proximity to the laccolite.

The marked similarity of the mineralized igneous intrusion near Palaw village, with its deeply decayed granitic rocks *in situ*, to many deposits of like physical and lithological character in Malaya seems to the author to have diagnostic significance.

In the Palauk township, also in the Mergui district, over 200 tons of tin concentrates have been recovered from a similar intrusion not exceeding an area of five acres, in which the felspathic material predominates, while in the same district ($11^{\circ} 02' : 98^{\circ} 47'$) occur five other similar masses, which rise to 100-ft. above the surrounding plain. Boring proved detrital containing cassiterite only a short distance away from the hills, while the igneous intrusions, apparently laccolites, have been worked, it is reputed, for 200 years by the primitive methods of the Chinese miner. Where the sedimentary rock capping these laccolites has been penetrated deep enough aplitic material is revealed and forms their core.

Travelling farther northwards to the Tavoy district, these dome-like masses are much less frequent. In this district wolfram-tin occurrences were known as long ago as 1910, although their exploitation was handicapped by the absence of internal communications through evergreen forests until the outbreak of war, when roads were constructed to assist the production of wolfram required for munitions.

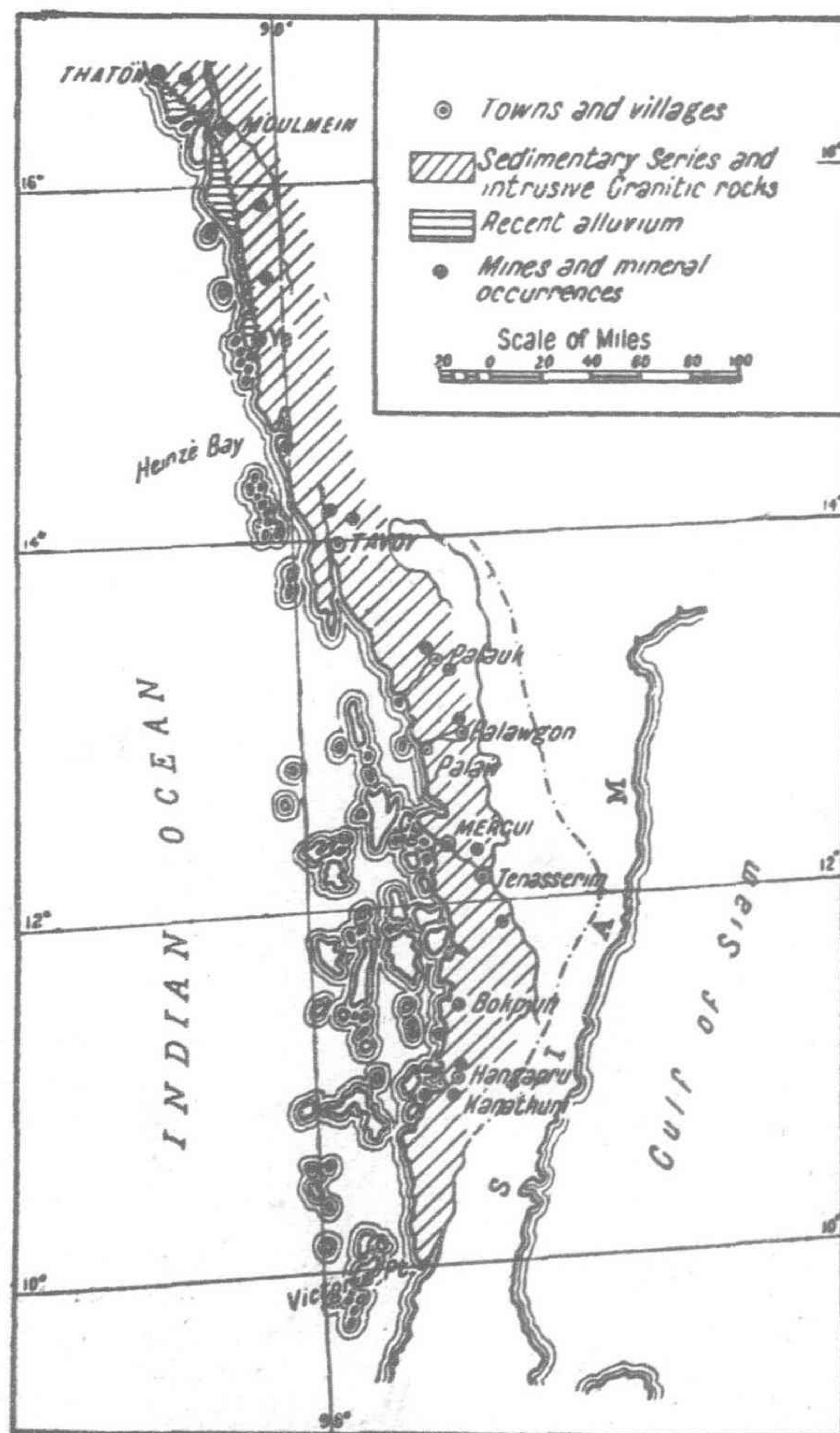


Fig. 1.—Sketch map of Lower Burma

*J. B. Scrivenor. "Geology of the Malayan Ore-Deposits" (pp. 64-9).

†W. R. Jones. "Tin Fields of the World" (p. 179).

‡R. H. Rastall. "The Geology of the Kinta Valley," *The Mining Magazine*, June, 1927.

The outstanding primary occurrence of the Tavoy district is that of the Hermyingyi mine, with a recorded output exceeding 17,000 tons of concentrates since being re-discovered. "Tin Hill," Hermyingyi (Fig. 3), seems to provide an example of a typical laccolite, which rises 650-ft. above the valley.

The largest-known secondary deposit of the Tavoy district is at Taungthonlon ("Three round hills"), where dredging activities commenced in 1911, although operations were suspended between 1914 and 1916. The total output from this deposit exceeds 7,000 tons of high-grade tin concentrates. Twenty years' dredging has not disclosed the source of this true alluvial deposit. While dredging a number of tin ingots approaching standard purity have been recovered, their antiquity being apparent from the depth that oxidation has penetrated the metal. This confirms the assumption of some much earlier mining industry in the neighborhood.

For its complexity rather than for the likeness to these normal igneous deposits, details of an occurrence at Bwabin mine, three miles south-east of Wagon village, Tavoy district, are included. By monitoring operations an intrusive breccia was uncovered at this mine, revealing along 500-ft. of strike four separate plutonic "plugs," the contacts showing "false cleavage" due to dynamic metamorphism of the sedimentary rock. The plugs appear to comprise fragments of pegmatite, greisen, and quartz, cemented in a porous, hard, siliceous groundmass, the rock exceeding 30-ft. in width, striking north-60° west and dipping 46° into the hill. The hanging-wall contains a parallel 10-ft. wide plastic mass (assay SiO_2 97.6 per cent: Al_2O_3 Fe_2O_3 1.1 per cent: CaO 0.3 per cent: MgO trace), also with fragments of pegmatite, greisen, and quartz. Both the hard and soft breccia masses hold finely-divided, snuff-colored cassiterite. On a north-70° east strike numerous compact quartz veins and lenses from 2-in. to 2-ft. wide, dipping 60°, occur on both sides of the breccia mass, although they do not appear to intrude into it. Bordering the north-70° east quartz veins the vitrification of the sedimentary rock

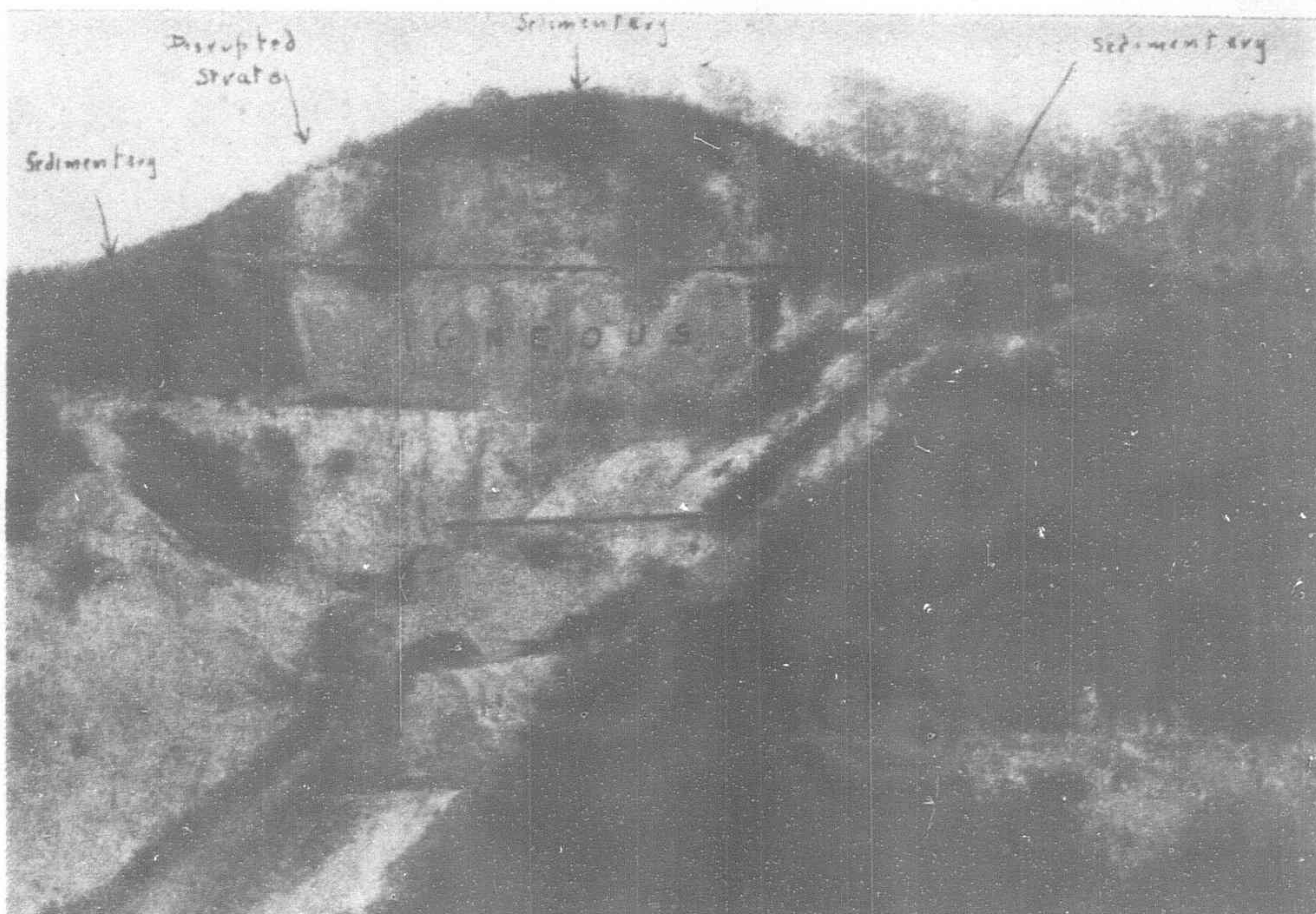


Fig. 3.—"Tin Hill," Hermyingyi District

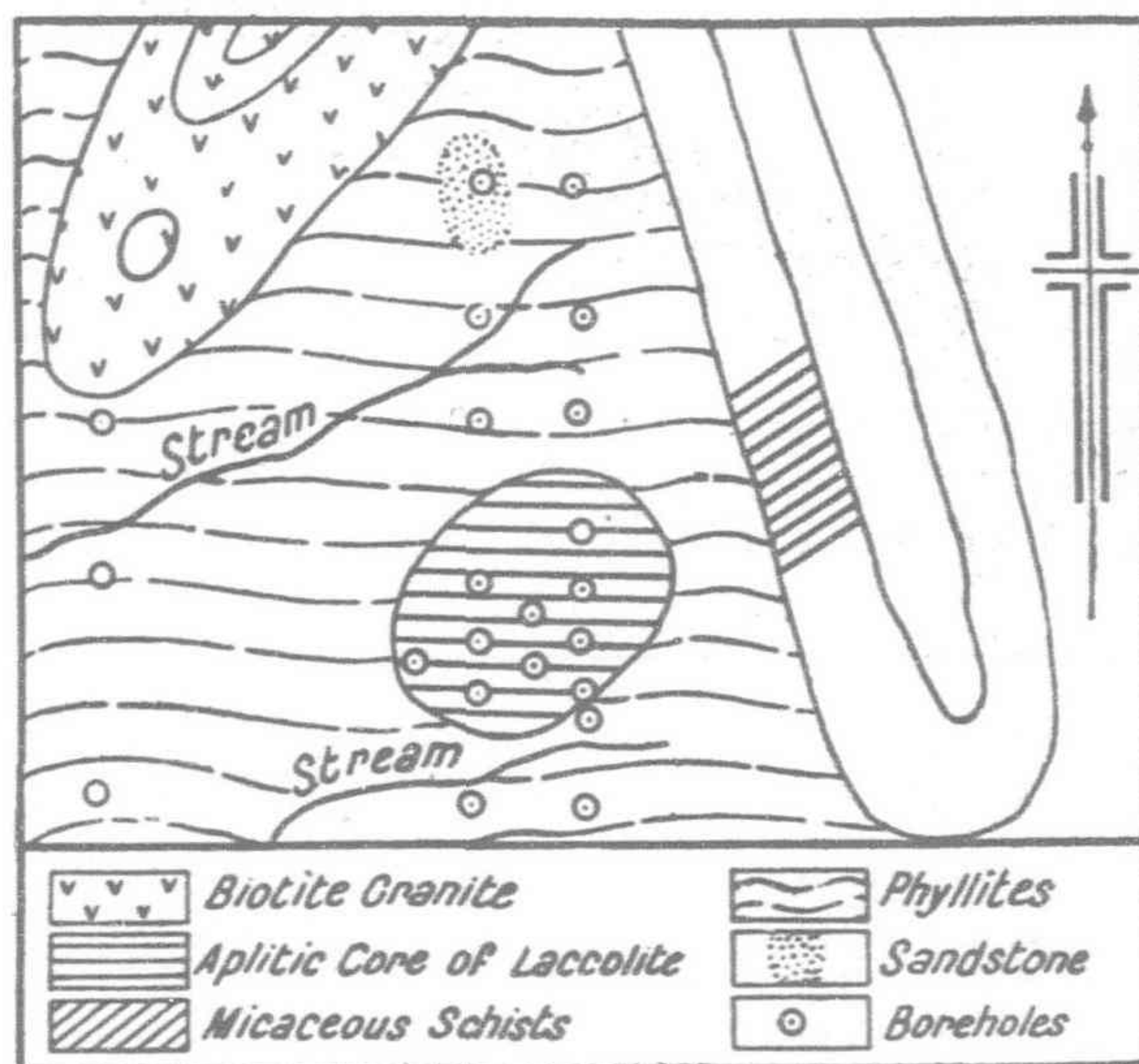


Fig. 2.—Geological sketch map of area around Palaw Intrusion

exceeds 12-ins., being more pronounced on the foot-walls. Metamorphosed sedimentary rocks common to the district capped the occurrence prior to mining, so that the breccia rock could not be regarded as consolidated scree material or as a result of the accidental infilling of a vein, as has been suggested. No igneous rock other than that referred to has been disclosed by adits or monitoring operations. One inch cubes of pyrite, completely altered to limonite, are not uncommon in the breccia, while small books of green tinted mica occur and dendritic patterns from manganese are frequent. Two epochs of mineralization are clearly represented, the older conveying finely-divided cassiterite (assay 60 per cent Sn; 10 per cent WO_3) to the north-60° west series, which are faulted, the younger north-70° east series yielding massive wolframite (hübnerite), with under 20 per cent Sn. in the recovered concentrates.

From the hard siliceous breccia boulders resulting from mining a small quantity of finely-divided, distinctive, snuff-colored cassiterite is liberated at various stages of the journey by the disintegration of the boulders, milled in a steep mountain gorge, an alluvial deposit in the making. Following periods of flood fossickers pan and recover the freed cassiterite (fineness minus 20 mesh I.M.M. screen) along the banks of the river for 2½ miles from the primary occurrence.

The distinctive igneous domes, cupolas, laccolites, or other minor intrusions of the Burma-Malayan peninsula are composed of fine-grained granite, generally with white mica. This rock readily decomposes in the tropics. The main mountain chains—the complex type—are built up of coarse biotite granite, in which decomposition is slow, leaving hard exposures owing to the effects of more active denudation. From personal observations and from the available literature on the subject biotite granite would appear to be devoid of economic tin occurrences, at any rate in this province.

(Continued on page 313)

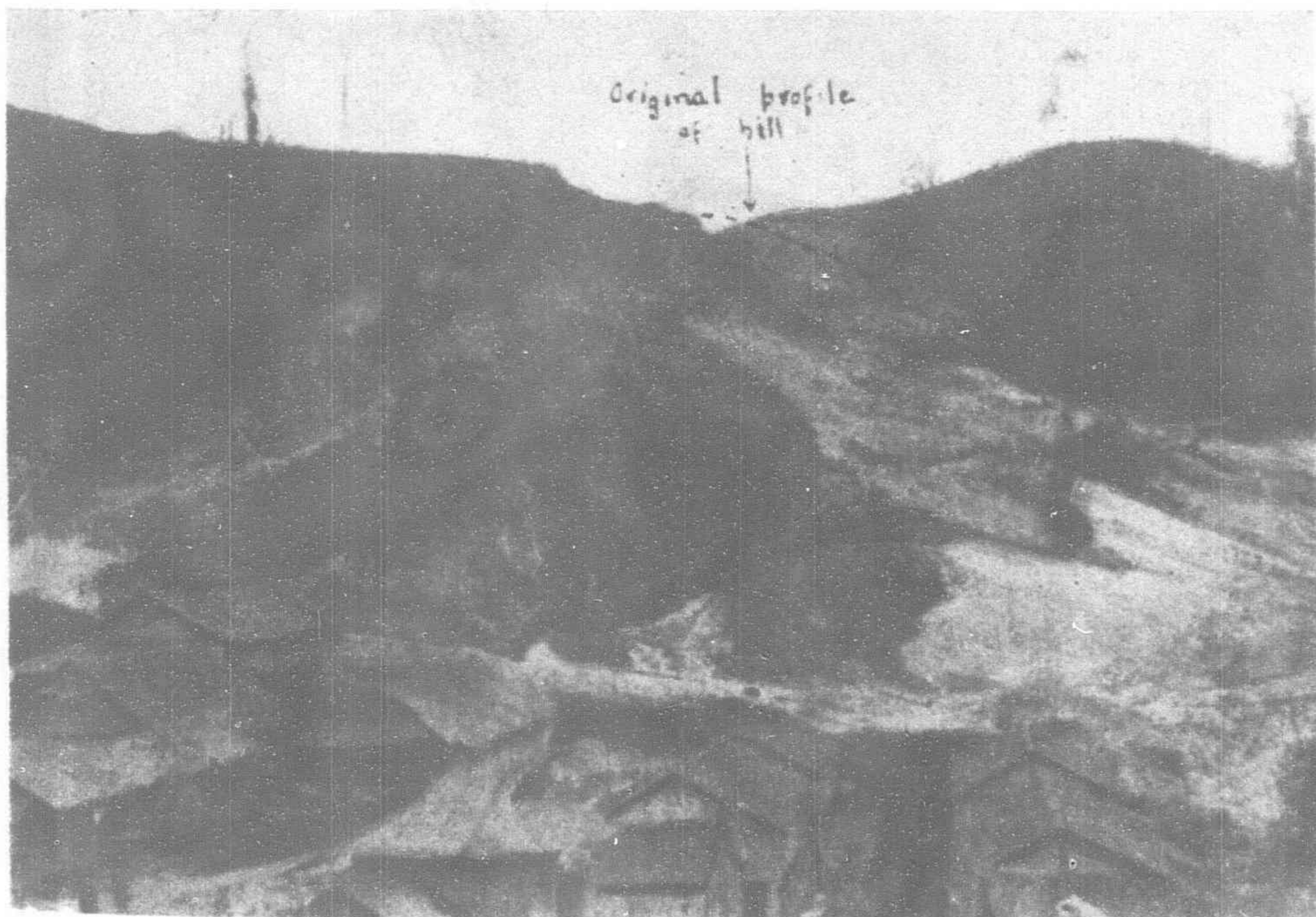


Fig. 4.—Bwabin Mine, Tavoy District

The Port of Tientsin and Its Problems

By MARGARET A. HITCH, in the "Geographical Review"

"THE harbor and the upper reaches of the Hai Ho rapidly silted up and the port was closed to sea-going vessels by the middle of June." From the latest (1933) report of the Maritime Customs to the earliest, the navigational problems of the port of Tientsin have called for attention. For Tientsin is an important port, the leading port of North China; with only two southern ports, Shanghai and Hongkong, surpassing it in value of either their foreign trade or their total trade. The greatness of the port lies, in fact, in the sources whence the navigational difficulties arise; for Tientsin, 35 miles from the head of the Gulf of Chihli, offers the nearest sea outlet for the North China plain with its abundant harvests and its silt-laden rivers. The more important waterways of North China, excluding the Hwang Ho but including the Grand Canal, focus on Tientsin. Its tributary territory stretches out to the Mongolian plateau and included part of Manchuria until the present alienation of the province of Jehol, an event "likely to have a permanent effect on the prosperity of Tientsin."

Under stress of military disturbances in recent years, part of the trade from the northern part of the area has been diverted from Tientsin. It is estimated that the port lost four-fifths of its normal wool trade in 1926 for this reason. Influences have been active, too, in an endeavor to divert Mongolian products from the Kalgan-Tientsin route to that of the Chinese Eastern Railway. The area from which most of the trade of Tientsin comes is about equal in size to the United States east of the Mississippi River.

From its early days as a treaty port raw cotton has figured as a principal export of Tientsin, and it still continues to head the export list. Wool, another important staple, had dropped to fourth place by 1931, but it gained in 1933 and nearly offset the loss in cotton in that year. Wool comes chiefly from Kansu and Mongolia. Other

important exports are hides and skins, also in large part from Mongolia; eggs and egg products, beans, tobacco, and walnuts from the plain; bristles from the northern Hopei and Manchuria; and carpets and rugs manufactured in Tientsin. The commercial status of Tientsin gives it advantages in the trend from the household type of manufacturing to the factory, and already the city has important rayon and cotton-weaving establishments as well as carpet factories.

A careful analysis of the import trade in cotton piece goods is included in the earliest reports of the Maritime Customs. To-day this item is still the one of greatest value in foreign imports, though Japan has taken the place of the United Kingdom as the principal source of supply. Other important imports include rayon, cotton yarn, and raw cotton—largely of finer grade from India—for manufacture. Kerosene comes from California; machinery—important groups are textile and electrical—from Germany, the United Kingdom, the United States, and Japan. Food imports come largely from other parts of China; the refineries of Japan furnish sugar.

Since Tientsin was opened as a treaty port in 1861 its trade has grown almost continuously. For some ten or fifteen years before the World War this trade increased markedly, and its volume was augmented still further during the war. Measured in haikwan taels, trade returns showed a drop after the war followed by an almost constant increase; in terms of

American money, however, 1919 was the peak year, though 1926 was not far behind. In the last three years, Tientsin, in common with the rest of the world and with the addition of the Manchurian difficulties, has suffered a sharp decline in trade.

With political conditions, price of silver, character of harvests, with all the factors that affect the trade of the port for a given year, must be included the state of the port facilities. Here the port has a perpetual problem. "The eternal struggle of the

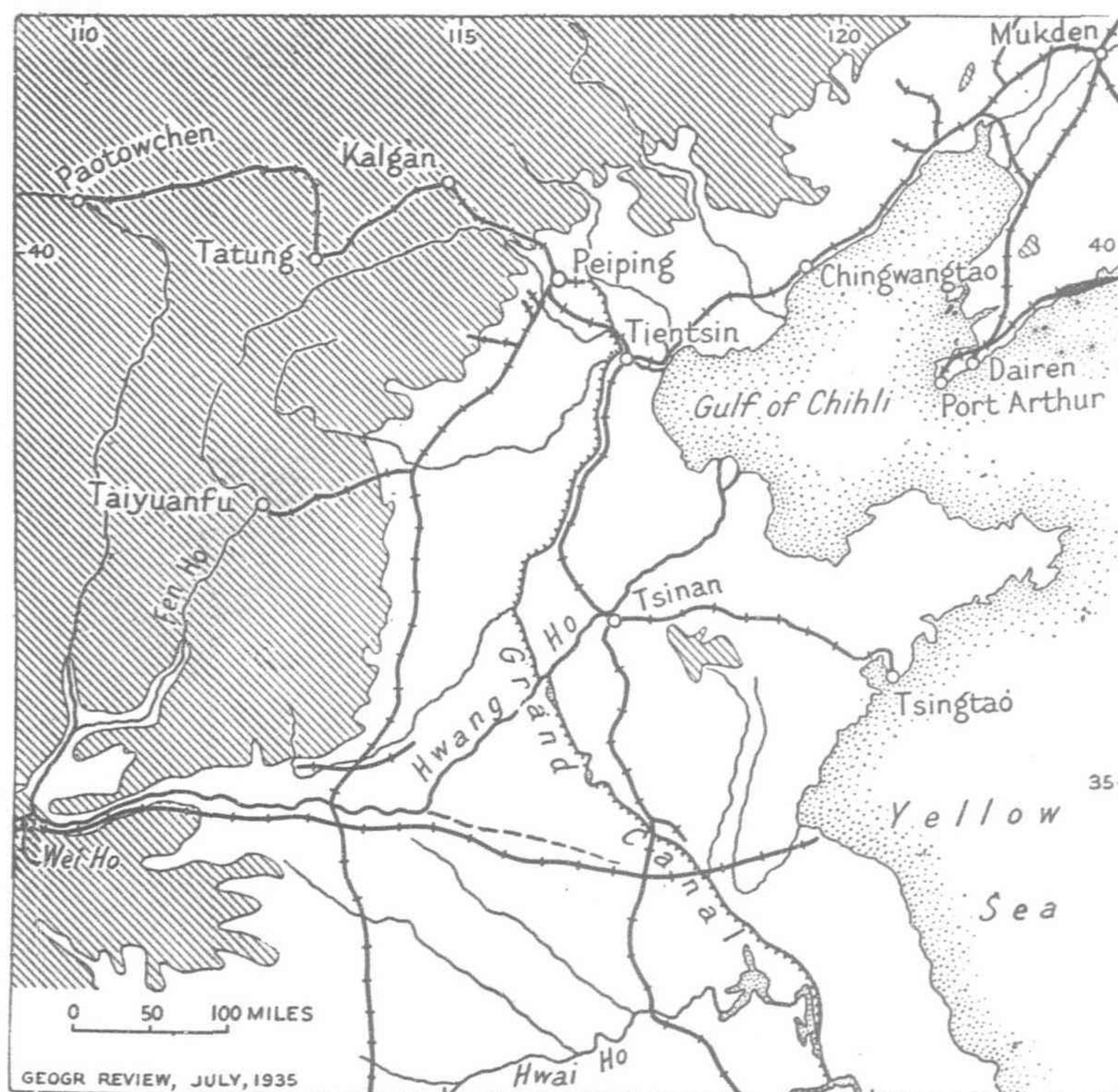


Fig. 3.—Sketch map illustrating the situation of Tientsin on the North China plain and its relation to the main waterways and railroads. The shaded area is over 400 meters in altitude. Scale. 1: 15,000,000



Fig. 1.—Scene along the Bund in Tientsin

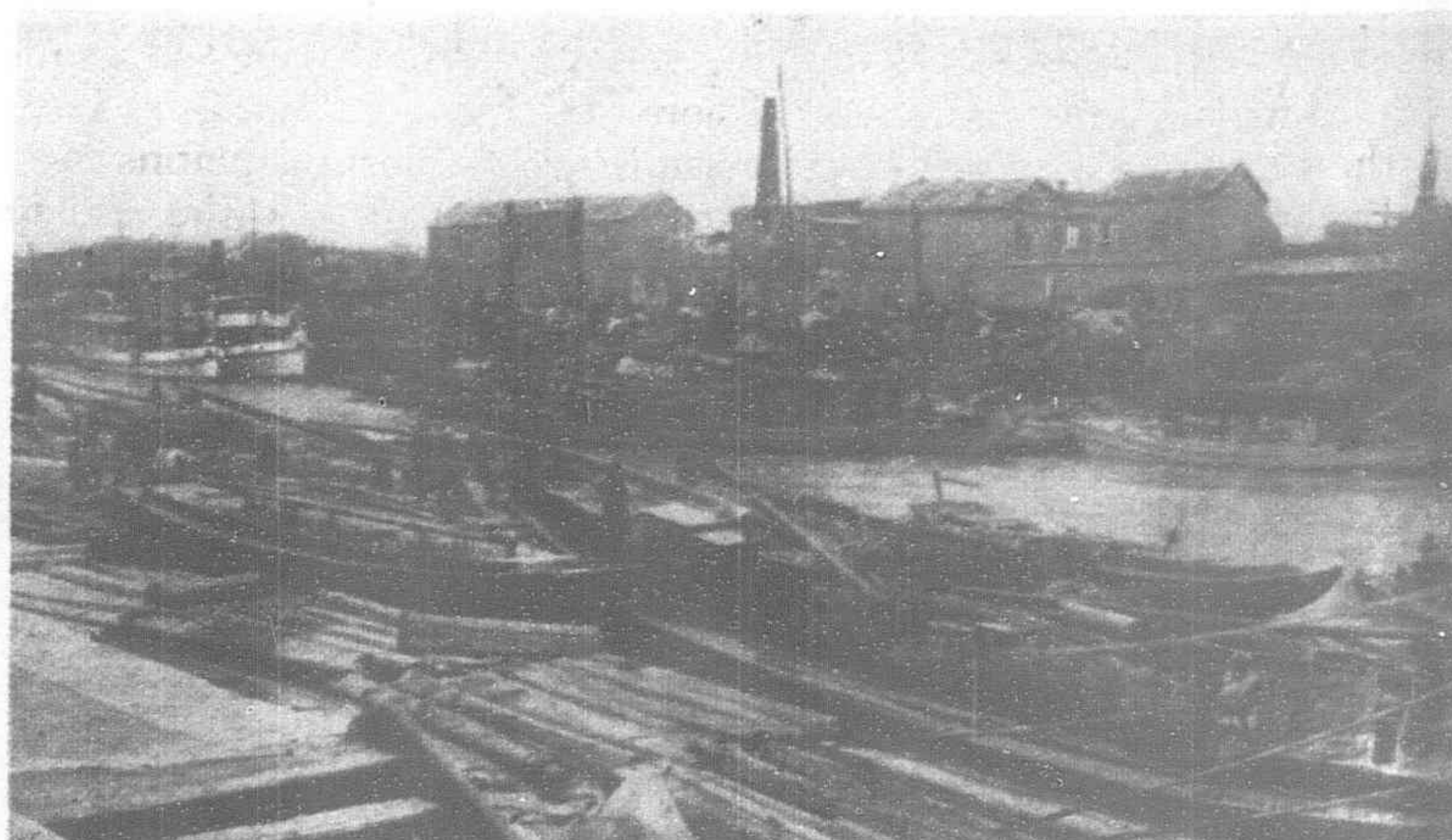


Fig. 2.—River Scene on the Hai Ho, Tientsin

(Photographs by courtesy of the U.S. Bureau of Plant Industry).

enterprising merchants, foreign and native alike, of Tientsin can only be compared to the fight of the farmers of the province against the forces of nature, both having the same problem to solve."

The Flood Problem

The great plain of North China, practically flat for long distances, is both the result of floods and a contributing factor in their recurrence. Rivers, draining a region of more than 88,000 square miles around Tientsin, converge at that city (Fig. 7) to form the Hai Ho. Once they have left the loess hills to the west, these rivers meander across the plain made of their own deposits, being kept in their courses chiefly by old earthen dikes that frequently break under the stress of high water. So level is the plain that, with the surface waters in the form of immobile ice for some months each year, two or three years are commonly required for floodwater to reach the sea.

The rainfall regime of Tientsin itself may be taken as roughly representative of that of North China as a whole. The mean annual precipitation for a 35-year period is 20 inches (maximum, 31.3 inches; minimum, 10 inches); 73 per cent falls in the period June, July and August. Variation is great in both the amount of rainfall and the time of greatest intensity, and it is greater for the interior highlands than for the plains. The early advent of summer rains in 1933, for instance, brought disastrous results to the region about Tientsin.

Ordinarily the amount of water in the streams converging on Tientsin is not great: indeed, it is too little at times to permit the ready movement of the shallow-draft native sampans and junks. Before the rainy season the Yung Ting Ho is a mere creek two or three feet in depth (Fig. 8). But in the rainy season the volume is increased greatly, and when heavy rains occur simultaneously over the entire watershed the Hai Ho is unable to carry the water off to the sea, and the land is inundated. From recent records it appears that the region is subject to floods every six or seven years on the average. Certain areas are flooded every year so that no effort is made to cultivate them. During the flood of 1917 portions of the foreign concession at Tientsin itself were under water. The flood of 1924 again threatened Tientsin, inundated some 11,500 square miles of land, and totally destroyed the crops on 8,800 square miles. About one and a half million people were driven from their homes, great damage was done, trade disrupted, and the purchasing power of the people enormously reduced. Thus are the problems of flood control and port development interlocked.

Trade of the Port

Tientsin was poorly endowed by nature as a port site, and it has been only by constant improvement that the growing trade has been accommodated. The port has been handicapped because its outlet to the sea is a narrow, tortuous, silt-laden stream, at various times in dangerous flood, in exceedingly low water, or ice-bound, at whose mouth the wind-driven waves pile up the ocean sand and river silt in a bar some five miles in width (Fig. 4). The favorable situation with reference to the regions served, however, has outweighed these disadvantages. There are better natural harbors on the sunken coasts of the Liaotung and Shantung peninsulas; Chinwangtao on the extreme northeastern edge of the North China Plain has a better harbor. But because of the distance to these ports from the larger part of Tientsin's tributary area they do not handle much of the trade. They do compete with Tientsin, however, for trade in those sections of the area relatively near them—Chinwangtao, Newchwang, Dairen, and even Vladivostok to some extent, on the north-east; Kiaochow and Chefoo on the south-east. Table I gives the value of the trade of the port.

Periodically there is under discussion a project for the establishment of a "Great-Northern-Port" for China on the coast between Taku and Chinwangtao, the latest site favored being just east of the Ta Ching Ho estuary. Undoubtedly the cost of such a development must defer the materialization of the project, even if it should eventually win favor. The renewed consideration, however, for which there now exists a commission under China's Ministry of Communications and Ministry of Railways, perhaps is serving as

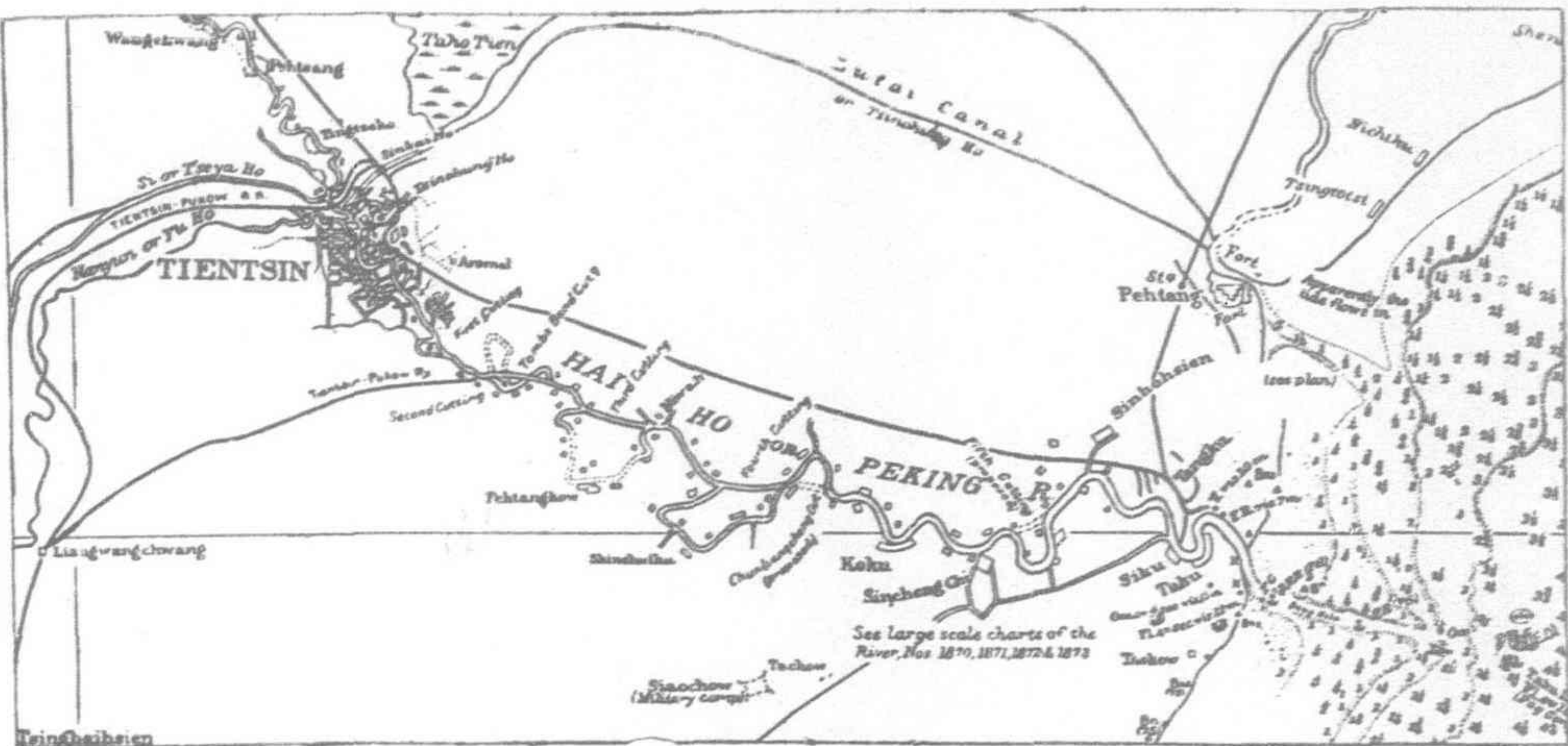


Fig. 4.—The Hai Ho, showing the course of the river between Tientsin and Po Hai (Gulf of Chihli) with its original bends and subsequent cuttings. Scale approximately 12 miles to an inch (Reduced from U.S. Hydrographic Office Chart 3229)

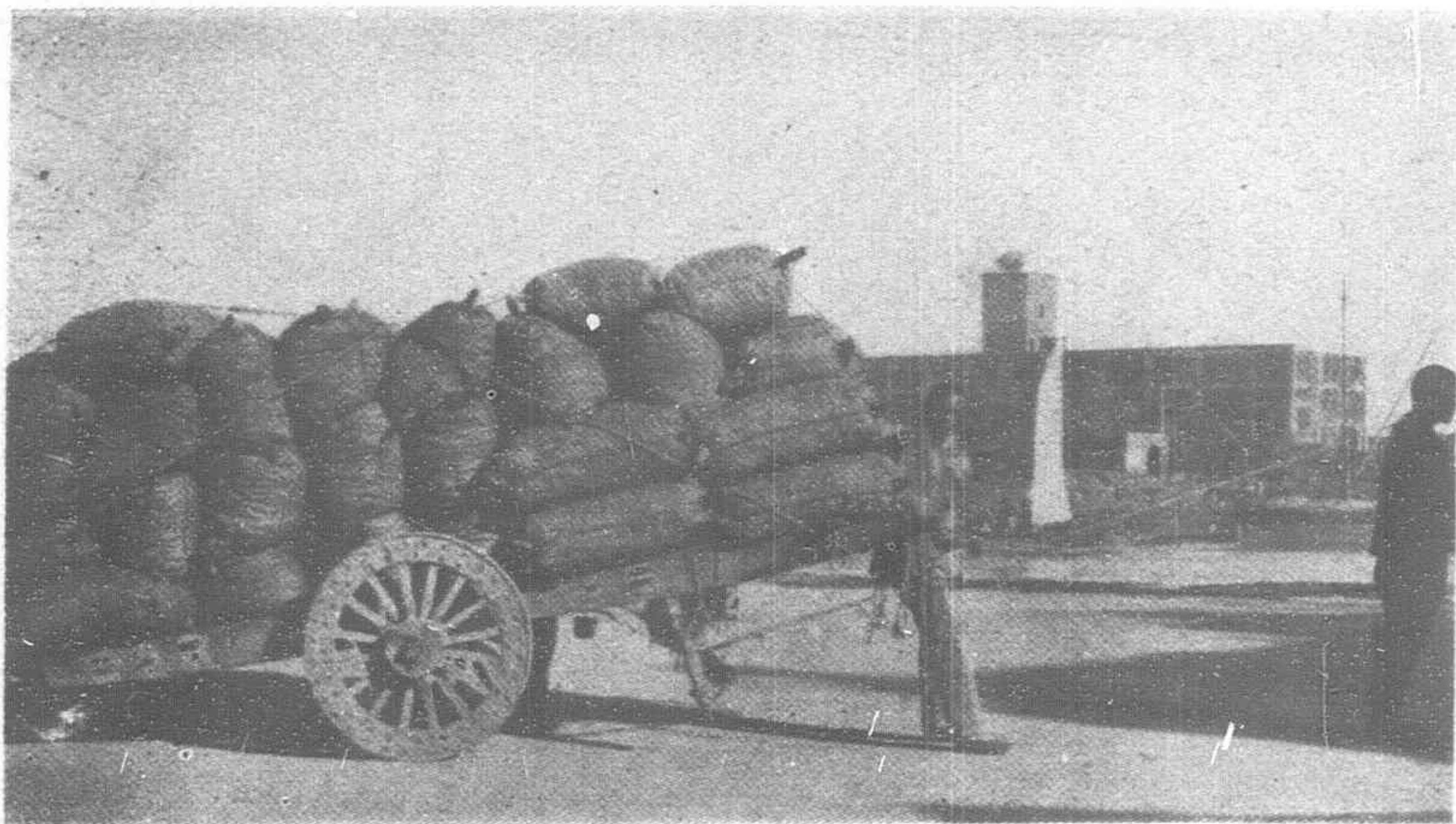
a spur to efforts for the solution of Tientsin's port problems, with a hope of bringing the establishment and maintenance of the facilities so badly needed.

Since the depth of water in the Hai Ho, even at high tide, will not accommodate all the vessels trading with this leading port of North China, it has been necessary to develop additional trade facilities near the mouth of the river. Tangku, on the north bank and a few miles from the mouth, may be called an auxiliary port of Tientsin. The Peiping-Mukden Railway passes through Tangku and by means of several spurs provides direct connection between the wharves and Tientsin. Tangku is well supplied with private wharves and godowns and has two dry docks and coaling facilities. Except in seasons of unusually heavy silting in the harbor and river, this port accommodates vessels of practically no deeper draft than Tientsin itself does, owing to the depth on

TABLE I—VALUE OF THE TRADE OF TIENTSIN
(In 1,000 Haikwan Taels)

Year	Imports	Exports	Total	Value of Tael Gold \$
F*	54,038	3,182	57,220	
1910 C	22,467	21,836	44,303	0.66
T	76,505	25,018	101,523	
F	71,622	7,620	79,242	
1913 C	25,567	30,209	55,776	0.73
T	97,189	37,829	135,018	
F	59,804	20,100	79,904	
1916 C	28,423	28,610	57,033	0.79
T	88,227	48,710	136,937	
F	86,741	27,471	114,212	
1919 C	33,191	44,079	77,270	1.39
T	119,932	71,550	191,482	
F	125,927	45,970	171,897	
1922 C	47,827	29,092	76,919	0.83
T	173,754	75,061	248,816	
F	110,310	61,704	172,014	
1925 C	80,979	38,234	119,213	0.84
T	191,289	99,938	291,227	
F	139,485	81,051	220,536	
1928 C	99,872	32,608	132,480	0.71
T	239,357	113,659	353,016	
F	137,388	87,902	225,290	
1931 C	83,833	45,062	128,895	0.34
T	221,221	132,964	354,185	
F	77,521	56,786	134,307	
1933 C	71,523	43,589	115,112	0.33
T	149,044	100,375	249,419	

*Figures, 1910-1931, marked F, same as at present; figures, 1933, marked F give value of direct foreign trade; those marked C give the value of Chinese produce, including re-exports; figures marked T show total of these values.



(Photograph by courtesy of the U.S. Bureau of Plant Industry).

Fig. 5.—A load of walnuts on the Tientsin Bund

the bar that vessels to Tientsin and Tangku alike must cross ; but it is available to those vessels that do not care to make the difficult trip up stream and during periods when severe freezing interrupts the river traffic.

The accompanying table gives for a number of years the record draft of vessels reaching Tientsin. The all-time record was 18 feet 3 inches in 1925, the usual accommodation being much less than this.

The Hai Ho Conservancy Board

The Hai Ho Conservancy Board, charged with the improvement of the river, was established by the Peace Protocol in 1900. One of the Board's objectives has been to straighten the tortuous channel to the sea. Five cuttings in the river below Tientsin have eliminated some of the largest bends while shortening the river distance between Tientsin and the sea from 56 to 35 miles and have improved the current by increasing its scour and decreasing its tendency to deposit silt (Fig. 4). Two more cuttings farther down the river

TABLE II—ARRIVAL OF VESSELS : PORT OF TIENTSIN

Year	Arriving at Bar	Crossing Bar	Arriving at Tientsin Bund		Record Draft to Tientsin
			Total	Draft 13 Feet +	
1898	—	—	0	—	—
1899	—	—	2	—	—
1900	—	—	4	—	—
1901	—	—	15	—	—
1902	—	—	134	—	—
1903	—	—	333	—	11'8"
1904	707	—	374	—	11'9"
1905	795	—	395	—	11'7"
1906	1,017	—	444	—	—
1907	856	—	513	—	13'6"
1908	788	—	511	—	13'6"
1909	1,006	—	623	3	13'6"
1910	992	—	607	9	—
1911	1,198	—	698	20	14'0"
1912	943	654	620	5	13'9"
1913	1,001	731	703	16	14'0"
1914	1,147	831	814	44	14'8"
1915	982	790	768	84	15'6"
1916	866	696	658	73	14'8"
1917	742	555	473	11	13'6"
1918	759	575	529	29	14'3"
1919	1,024	855	747	90	15'6"
1920	1,154	1,041	1,002	284	16'11"
1921	1,415	1,275	1,231	461	16'3"
1922	1,370	1,223	1,172	550	16'9" *
1923	1,447	1,288	1,269	755	16'10"
1924	1,502	1,337	1,311	794	17'6"
1925	1,896	1,711	1,702	1,100	18'3"
1926	1,889	1,702	1,665	994	17'11"
1927	1,701	1,503	1,235	361	17'4"
1928	2,031	1,791	668	0	13'0" †
1929	1,878	1,615	544	6	14'6" †
1930	1,781	1,556	1,460	528	—
1931	1,835	1,625	802	116	15'0" †
1932	2,149	1,934	382	18	13'5" †
1933	2,303	2,061	1,008	139	14'3"

*Record up; record down, 17' 4". †Limited depth in harbor.
‡Greatest depth recorded at Tientsin.

have been proposed. At Tientsin in the native city two cuttings have been made near the junction of the Grand Canal, the Hsi Ho, and the Pei Ho where there are some difficult bends. One of these, the Cathedral Cutting, so improved the flow of water that the daily range of the tide just above the cutting was increased from 3.64 feet to 5.56 feet and the depth of water in the Tientsin anchorage was increased some two feet. The limitation on the length of boats that can round the bends and swing for the return trip, has been lessened to some extent by the cuttings. Widenings of the river at Tientsin have produced, in effect, two swinging berths, or turning basins. The length of vessel that now can swing at Tientsin is 325 feet, but it has been proposed to enlarge one of the swinging berths to accommodate vessels up to 350 feet in length.

In 1911 observations on ice conditions were begun to ascertain whether it would be feasible to keep any part of the Hai Ho open and thus keep the trade of Tangku, if not of Tientsin, uninterrupted through the winter. Reports were favorable, and two icebreakers were accordingly purchased for operation the following season. Subsequent experience has shown that in normal winters the bund at Tientsin can be made accessible to vessels without serious interruption but that in unusually severe winters only Tangku can be kept open. The elimination of more of the bends where ice tends to collect will be of aid in clearing the river of this obstruction. A dike extending for some 6,000 feet along the north flats at the mouth of the river has been constructed at a cost of \$25,000 to prevent the ice that forms on the flats from being carried into the river either by the tide or by strong east or north-east winds. The winter of 1930-1931 was probably the severest ice season in the history of Tientsin shipping. Early in February a north-east gale set in, followed by continuous easterly winds. These brought an enormous amount of drift ice to the bar, and an ice field formed that extended 70 miles out to sea. The ice piled up to 10 feet in thickness. Three large icebreakers worked in the channel, and ships could move only in convoy. After more than two weeks a change of wind cleared the ice away in a few days. Despite the severity of the winter, however, more ships are shown to have crossed the bar during this ice season than during the previous one.

Plans for the improvement at the mouth of the river included the cutting of a new dike-enclosed channel through the bar to allow ships drawing 20 feet to cross at high tide. Work was begun in 1924. Dikes measuring 33,000 feet in length were completed in 1927, and dredging was in operation. However, difficulties of execution increased to such an extent that a halt was called to consider the project anew. The accumulation of silt on the flats through which the channel was to run, the return of silt to the channel by wave action, and the weakening of the wooden structure of the dikes by sea borers (teredos) were factors in bringing about a decision to abandon the project. Operations since have been directed toward the improvement of the old channel.

Silting the Basic Problem

The gravest problem of the port is this matter of silting. The spring and summer floodwaters of the Yung-Ting Ho bring most of the silt to the Hai Ho. The drainage area of this stream covers



(Photograph by courtesy of U.S. Bureau of Plant Industry)

Fig. 6.—A caravan of 42 wool-carrying camels from Kansu. They have been 27 days en route and are two days from their destination, Yutze, a railway station in Shansi

some 22,000 square miles, a large part of which is in the loess, and, owing partly to the precipitous nature of the hills and partly to the lack of trees and other vegetative covering, erosion is excessive. It has been estimated that the time required for the removal of one foot from the basin of the Yung Ting Ho is 840 years as compared with 940 years for the Hwang Ho and more than 4,000 years for the Mississippi. The maximum recorded silt load of the river is 38 per cent by weight. From two topographic surveys made in 1921 and 1927 in the delta of the Yung Ting Ho and on river-bed and flood-plain deposits it has been estimated that the Yung Ting Ho carries annually from 27 to 30 million cubic meters of silt.

Viceroy Li Hung-chang, some fifty years ago, attempted to divert this floodwater from Tientsin. The several canals constructed were satisfactory in that they provided additional runways for the floodwaters. They also increased opportunities for inland navigation; but they played havoc with the navigation of the port, for they carried so much of the water of the Pei Ho to the Paitang Ho that the level of the Hai Ho was lowered and its current lessened. This decreased its scouring ability and increased the opportunity for the deposition of silt. Fewer and fewer vessels risked coming up the river; in 1898 not one vessel came to Tientsin, and in 1899 only two came. One of the first acts of the Conservancy Board was to close three of the largest of these canals with locks and thus restore to the Hai Ho its greater volume.

Since that time dredging has been carried on assiduously, in an effort to remove the annual deposits and, further, to increase the depth of the river. Additional dredging in the harbor has been necessary, since ships have increased in size and all but very shallow-draft boats must take advantage of high tide both in crossing the bar and in coming up the river.

Dredging in the harbor, however, has attendant dangers. Special precautions have had to be taken to protect the banks from being undermined. In years of exceptionally high floods much ground is lost. During the summer flood of 1931 as much as 400,000 fang of silt, according to estimates, was deposited in the harbor in the course of 24 hours, while the daily output of the dredging plant was only 800 fang. The bed of the river was raised $5\frac{1}{2}$ feet in a few days. After the floods of 1917 the depth of water on the Taku bar was found to be 2.5 feet at ordinary low water, whereas before the floods it was nine feet. A deposit of nine feet of silt in 48 hours is recorded. Thus the results of the dredging of a season may be wiped out in a few hours.

For some years before March, 1927, a satisfactory depth of the river had been maintained for at least a part of each year. On the twenty-second of that month a steamer drawing 17 feet 6 inches reached Tientsin without difficulty. Then came the spring freshet of the Yung Ting Ho carrying an unusual amount of silt, which reduced the channel depth to 12 feet in a few days. In 1928 silting continued to gain on scouring plus dredging, and in July of that year—the time of the summer flood—official notice was issued that no coasting vessel entering the river should proceed

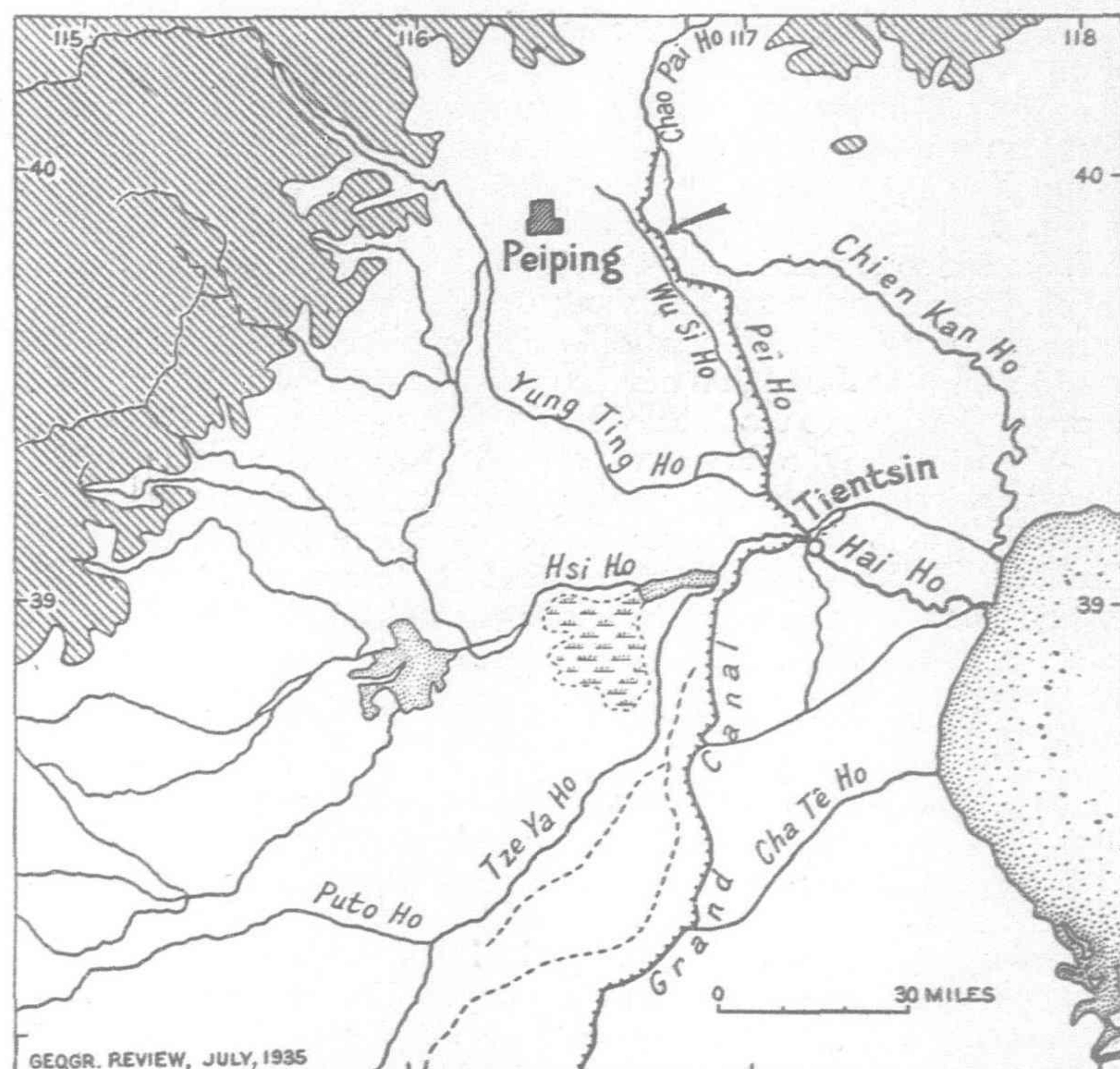


Fig. 7.—Sketch map showing the principal rivers converging on Tientsin to form the Hai Ho, their only outlet to the sea (after the Atlas of China, edited by V. K. Ting and W. H. Wong of the National Geological Survey, Peiping, and published by the Shun Pao Press, Shanghai, 1934). The arrow indicates the region in which the Chao Pai Ho broke its banks and its waters found an outlet through the Chien Kan Ho. Scale 1: 3,800,000.

above Tangku. In November the channel was opened to a depth of 10 feet, but it was almost another year—October, 1929—before vessels drawing 13 feet could reach Tientsin. Immediately after the next spring freshet the depth was reduced to eight feet.

The Palliative Scheme

Various plans have been proposed in the last few years to provide a permanent remedy for both flood and silt problems. However, as the need for immediate relief is urgent, a temporary "palliative scheme" has been brought into operation.

Under this scheme (Fig. 9) a barrage, or regulator, has been built across the Pei Ho immediately below the point where it is joined by the Yung Ting Ho, while just above the regulator a channel 200 meters wide has been cut from the Pei Ho eastward through the embankment of the Peiping-Liaoning Railway to a settling basin. A channel for routing the clear water back to the Hai Ho is to lead from the south-west corner of the settling basin to the lower Pei Ho. As this outlet will be on the same side of the basin as the inlet for silty water and relatively near it, a partition dike is to be built. According to the last reports available, this channel and dike had not yet been completed. From the south-east corner of the settling basin an outlet channel to the Chin Chung Ho has been constructed which, until the southwestern outlet is completed, provides the only means of egress for the clear water. The land flooded by diversion of the freshets to the settling basin is private property, and it is important that it be kept under water only a short time.

To protect the homes of the people living in the settling basin, dikes have been built around its 18 villages. A dike 18.7 kilometers in length extends across the southern edge of the basin and keeps the water within the basin on the low side. The top height of these dikes is six meters, Taku Datum, and their earthwork measures 1,642,000 cubic meters. Intakes and drainage culverts are arranged in the village dikes for the convenience of the villagers.



(Photograph by courtesy of the U.S. Bureau of Plant Industry).

Fig. 8.—The Yung Ting Ho, north-west of Peiping. Next to the Yellow River this stream is the greatest contributor to the flood troubles of North China. Before the rainy season the stream has a depth of only 2 or 3 feet.

The first diversion of floodwaters to the settling basin was that of the summer flood that began on the night of June 30, 1932. According to plans made by the committee in charge of operations, diversion was scheduled to take place when the joint waters of the Yung Ting Ho and the Pei Ho carried as much as 10,000 cubic meters of silt a day or when the water level of the Yung Ting Ho at Lukouchiao reached 61 meters, Taku Datum. On the morning of July 1, the silt content of the Yung Ting Ho was found to be six per cent and the rate of discharge 145 cubic meters a second. Diversion was begun. On July 6, its burden of silt having been dropped, the clear water began to reach the outlet leading to the Chin Chung Ho.

Unfortunately a large amount of clear water was diverted unnecessarily with the silty water, so that the basin became filled before it had accommodated all the silt-laden flood of the Yung Ting Ho. It became necessary, therefore, to revert the remainder of this flood to its old route through the Hai Ho. The harbor, which had had very little silting during the period of diversion, suddenly received silt deposits four and five feet deep. However, high waters of the tributaries from the south aided in scouring the harbor and carried the silt in the usual wave formation to the sea.

The source of the clear water was the Chao Pai Ho. In 1912 this stream, then a tributary of the Pei Ho, broke its banks east of Peiping and found an outlet to the sea through the Chien Kan Ho (Fig. 7). Its relatively silt-free waters, however, were needed as a diluting agent in the Hai Ho. In 1926 control works were completed by which the waters of the Chao Pai Ho could be directed either to the Pei Ho or to the Chien Kan Ho as there should be need. In this instance the waters should have been directed to the latter instead of the former as actually was done.

From measurements taken of the silt deposited in the basin during the summer floods it is estimated that these deposits amounted to 13,000,000 cubic meters in the dry state. It is estimated further that had the spring flood been diverted an additional deposit of 1,000,000 cubic meters would have been made. Although the height of the protective dikes is six meters, Taku Datum, the waters have not been allowed to rise above 4.5 meters. The total capacity of the basin up to this level is given as some 275,000,000 cubic meters, but, since deposition will not be uniform, the full capacity cannot be utilized, and the engineers consider that a deposit of 225,000,000 cubic meters is a reasonable expectation. The life of the settling basin, on the basis of the 1932 floods, would be 16 years.

Although 1933 began encouragingly enough, with early spring soundings showing a depth improvement over the 13 feet of November, troubles soon arose. Diversion was handicapped by objections on the part of the villagers of the settling basin to the flooding of their lands. Then the summer flood came unusually early and was unduly prolonged. The depth lost in the summer was, however, regained in the autumn, and by early November the river once again had a permissible draft of 13 feet. The loss of depth on the bar was restored also, almost entirely.

The silt deposited in the settling basin in 1933 is estimated at 26 million tons, double that of 1932, and shortens the possible life of the basin. The estimate of the silt load of the Yung Ting Ho and the Pei Ho that could not be diverted but was carried into the Hai Ho is seven million tons, making a total of 33 million tons brought down by the two rivers. Thus it may be assumed that the silting that would have taken place in the river and on the bar in the absence of any diversion would have brought an even more serious situation than the port has ever experienced. On the other hand, observations made during the flood season indicate that no deterioration whatever would have come if the palliative scheme as planned had been in complete and proper operation.

That this is only a palliative scheme, however, must be remembered. It offers, through the present settling basin, a respite of only a decade or two. There are, however, other low areas between this basin and Tientsin and also along the Chin Chung Ho which might be utilized as settling basins and thus prolong the life of the palliative scheme to possibly one hundred years. An unsatisfactory feature is that water routed through the Chin Chung Ho is lost to the Tientsin harbor. These areas are alkaline and sandy and if built up with rich silt of the Yung Ting Ho may be converted into farm land.

Proposed Permanent Solution

The latest of the proposed permanent schemes has been put forth by the engineers of the North China River Commission, who plan to extend operations back into the mountains to the source of trouble. They propose to build two large detention dams along the upper course of the Yung Ting Ho at favorable places before the river reaches the plain. Farther back in the mountains, on the two chief streams that unite to form the Yung Ting Ho—the Yang Ho from the Inner Mongolian Plateau and the Sang Kan Ho from the Wu Tai Shan Mountains—a series of check dams are planned, five on one river, six on the other, with additional ones as found desirable. Their purpose is to reduce stream gradient and velocity and thus diminish the amount of silt carried down stream.

An improved weir is proposed, at a point below the detention dams, by means of which excessive floodwaters may be diverted to certain streams to the south, whose waters, after a circuitous route advantageous to silt deposition, rejoin those of the Yung Ting Ho just west of Tientsin.

This scheme includes also the reclamation of certain low areas, chiefly alkaline, sandy, or swampy, bordering the Yung Ting Ho, outside its dikes, for a stretch of some 65 kilometers as it crosses the plain. These areas, which lie below the level of the present bed of the river, are to be "silt-depositing districts" and are to be built up gradually into fertile agricultural lands by successive layers of silt deposited on them by the mud-laden waters diverted there by means of sluices in the dikes. It is to be hoped, furthermore, that

a broad reforestation program will be included in the executed plan.

Tientsin, since its rich tributary region was opened to foreign trade, has struggled through numerous and serious difficulties to serve it as the connecting link with the outside world. Repeated disaster—almost defeat—has been met. If present plans can be perfected in detail and operation, Tientsin may become a truly great port, and a major factor contributing to its greatness will be the increased prosperity that the plans for its own life will bring in turn to North China.

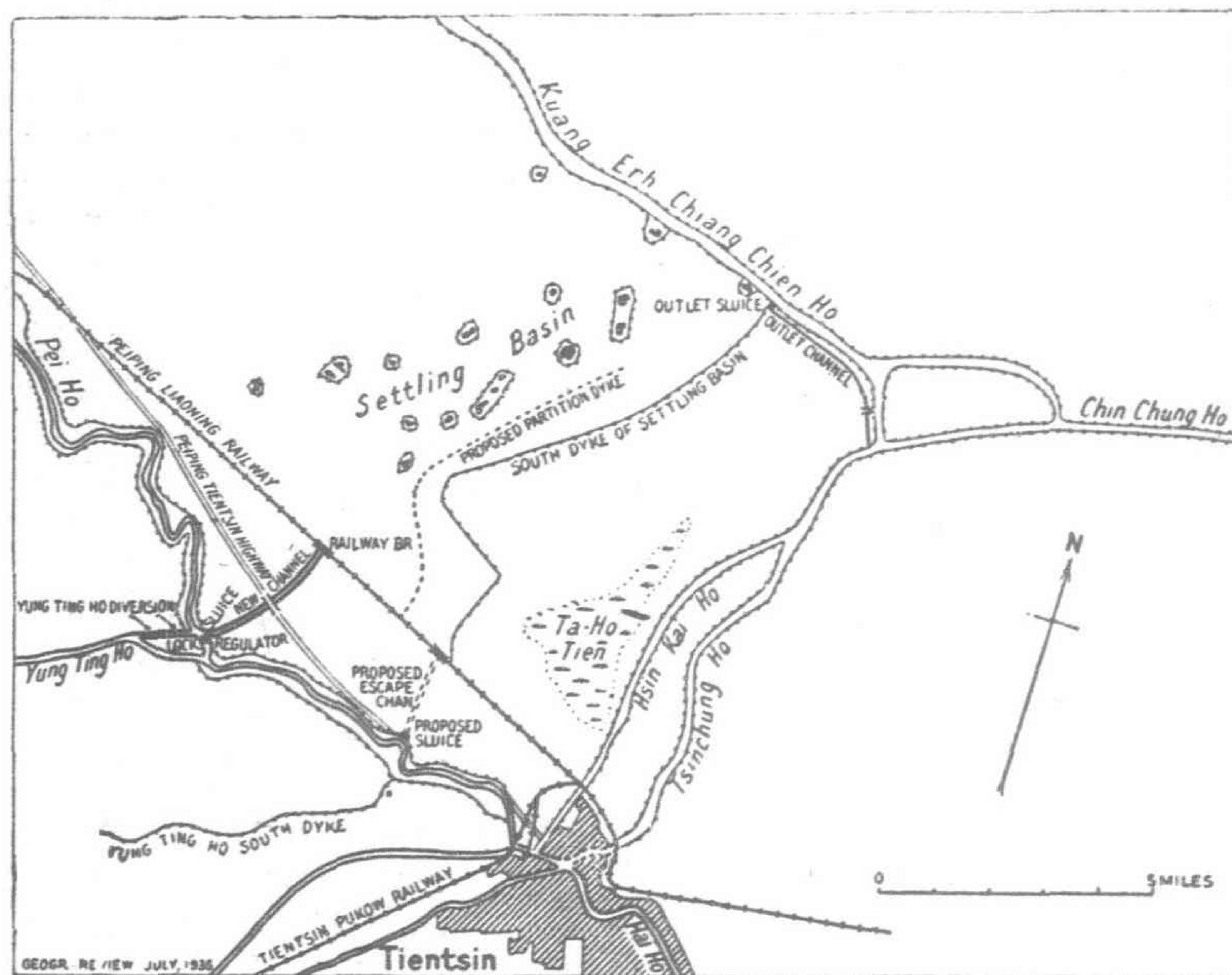


Fig. 9.—Sketch map of the Palliative Scheme, showing location of dikes and channels. After sketch maps of the Hai Ho Conservancy Board

Soviet Places Huge Order

The Soviet Union has awarded a contract for \$3,000,000 worth of machinery to the United Engineering Foundry Co.—one of the largest foreign orders ever received by an American machinery concern.

The contract called for delivery of a complete roller-bearing electrically driven rolling mill in connection with a proposed plant with an annual capacity of 600,000 metric tons of hot cold strip metal, a maximum of sixty inches wide.

The order was construed in some quarters to be Russia's answer to the widely-expressed opinion that Soviet recognition could not result in vast trade between America and Russia unless some settlement was made on the Kerensky debt issue.

Dnieprostroy Generators Exceed Their Guarantees

General Electric Company of New York Earns Bonus Under Tests of Engineers of the Soviets

As a result of tests conducted by U.S.S.R. engineers, the General Electric Company of New York has earned a bonus for exceeding its guarantees for efficiency of the five hydroelectric generators supplied by that company and installed at Dnieprostroy. It is believed that this is the first occasion of a foreign installation of apparatus in the Soviet Republic, taken under a penalty and bonus contract, where the manufacturer has exceeded his guarantee and earned a bonus.

The tests were conducted by the customer under the direction of Professor P. Tolvinsky, of the Leningrad Polytechnic Institute. One of the generators, given a complete efficiency test, showed that, at full load (77,500 kva., or 62,000 kw. at 0.8 power factor) the efficiency is 97.91 per cent. The customer's calculations for all five units showed an average full load efficiency of 97.87 per cent.

Depending on the average load carried (between

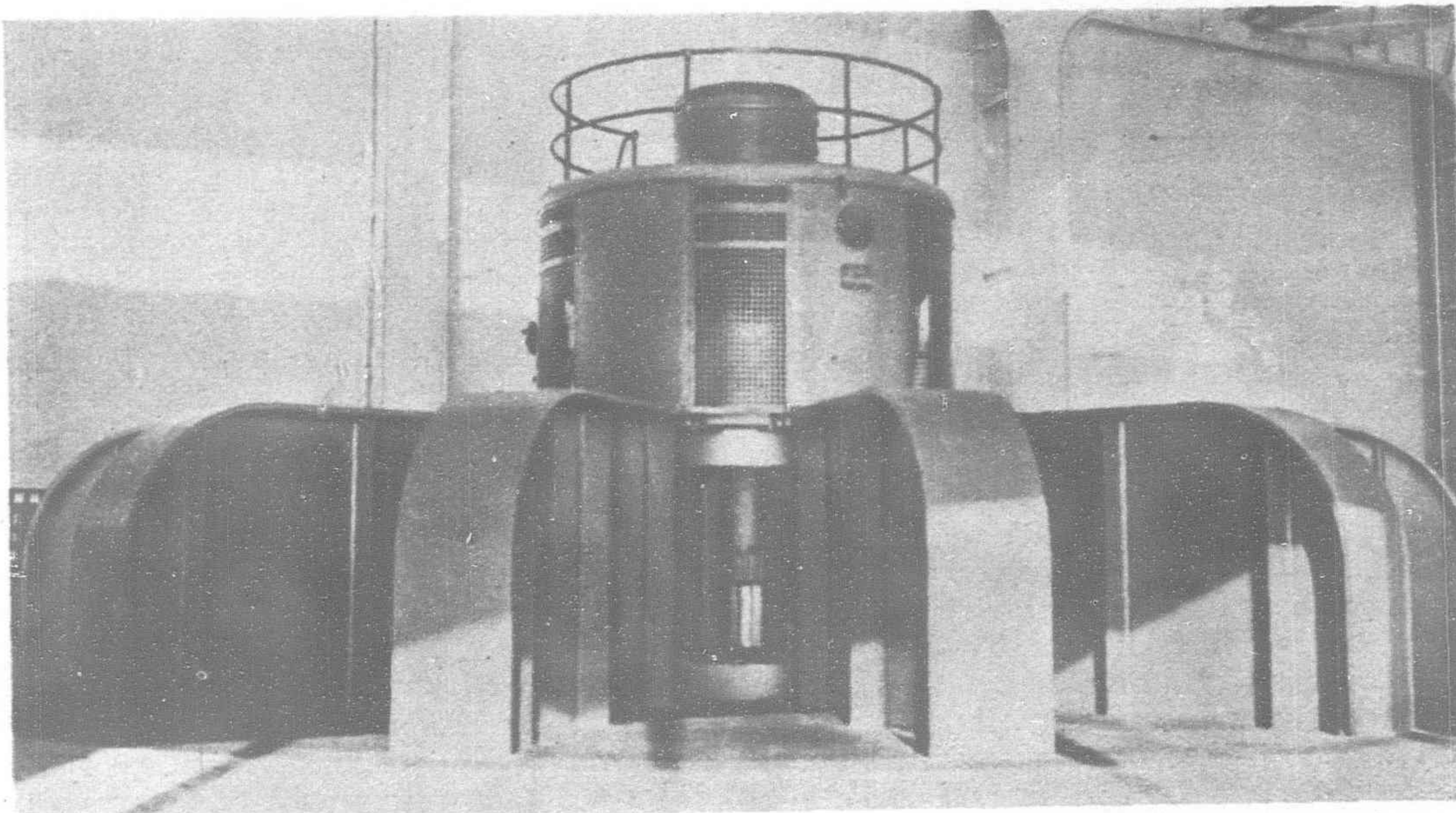
full and three-quarters load) the customer will obtain an increase of between 200 and 400 kilowatts above the originally expected total output of the five machines.

Colonel Hugh L. Cooper, American chief consulting engineer on the project, in commenting on the results of the tests in a letter to President Gerard Swope of the General Electric Company of New York, said:

"The task of designing, and building and erecting this equipment called for courage and technical and practical ability of the highest order. The success you have achieved all through the history of this undertaking is of signal and lasting importance to the engineering profession all over the world."

"That you have exceeded your contract guarantees and earned a bonus is a fine tribute to all the personnel engaged on this difficult job, from the mechanics in the shops on up to the top."

(Continued on page 313)



One of the five General Electric Vertical Generators in Dneproges Station, Dnieper River Development, U.S.S.R.



Five General Electric Vertical Generators, 77,500 kva., 88.2 r.p.m., 13,800-volts, 50-cycles. Type ATB, 68 Pole. Each coupled to Newport News Shipbuilding and Drydock Co. Waterwheel, in Dneproges Station, Dnieper River Development, U.S.S.R.

Engineering and Machinery in Malaya

By WALTER BUCHLER, in "Eastern Engineering and Commerce"

IN the early days sales of machinery as a rule were handled by people who had a general knowledge of merchandise, but who were not so familiar with this branch of business as they have to be to-day. One found merchants selling engines and machinery, at the same time handling piece-goods, etc.; sometimes there were engineering firms trying to do the same. The result was that the country was loaded with certain classes of goods that were not suitable, and many opportunities for the introduction of suitable articles and machinery were missed, because the people responsible for the sales were unable to educate or even to advise the buyers as to what met their requirements best.

Before the war Germany had already realized that experts were necessary for the development of trade in Malaya, but the war put a stop to all efforts in this direction. Nowadays, it is generally recognized that expert salesmanship is necessary, as can be seen by the large number of European experts engineering undertakings employ on their permanent staffs. The policy among some of the larger companies in Malaya is to have these men selected by the different manufacturers they represent. In this way it has been possible for one large engineering concern in Singapore to handle a great variety of lines, from heavy oil engines to paints.

In selling machinery in Malaya, firms do not confine themselves to any particular party or agent, but sell to anybody and everybody. It is possible for Chinese or Malay to come to the supplier, state his needs, and go ahead, assured that he is obtaining the best advice as to the launching, laying down, and running of his plant. Formerly, the supplier's idea was to load a buyer with whatever machinery he could be induced to purchase, irrespective of whether the materials were suitable or whether the customer knew how to operate the plant.

The methods for obtaining the business of European buyers in Malaya are more or less the same as in other countries. European engineers in charge of Government, municipal, or industrial undertakings are highly capable men. It is therefore essential to meet these engineers with men equally expert. The Chinese, too, are showing an ever keener demand for better service. Preliminary negotiations are usually conducted through a Chinese compradore, who is in close touch with Chinese buyers. He advises his firm as to the suitability of prospective clients, and is generally aware of most of the new work they have planned. Once he has referred a possible client to his firm, it is for its experts to convince the client of their ability to meet his requirements.

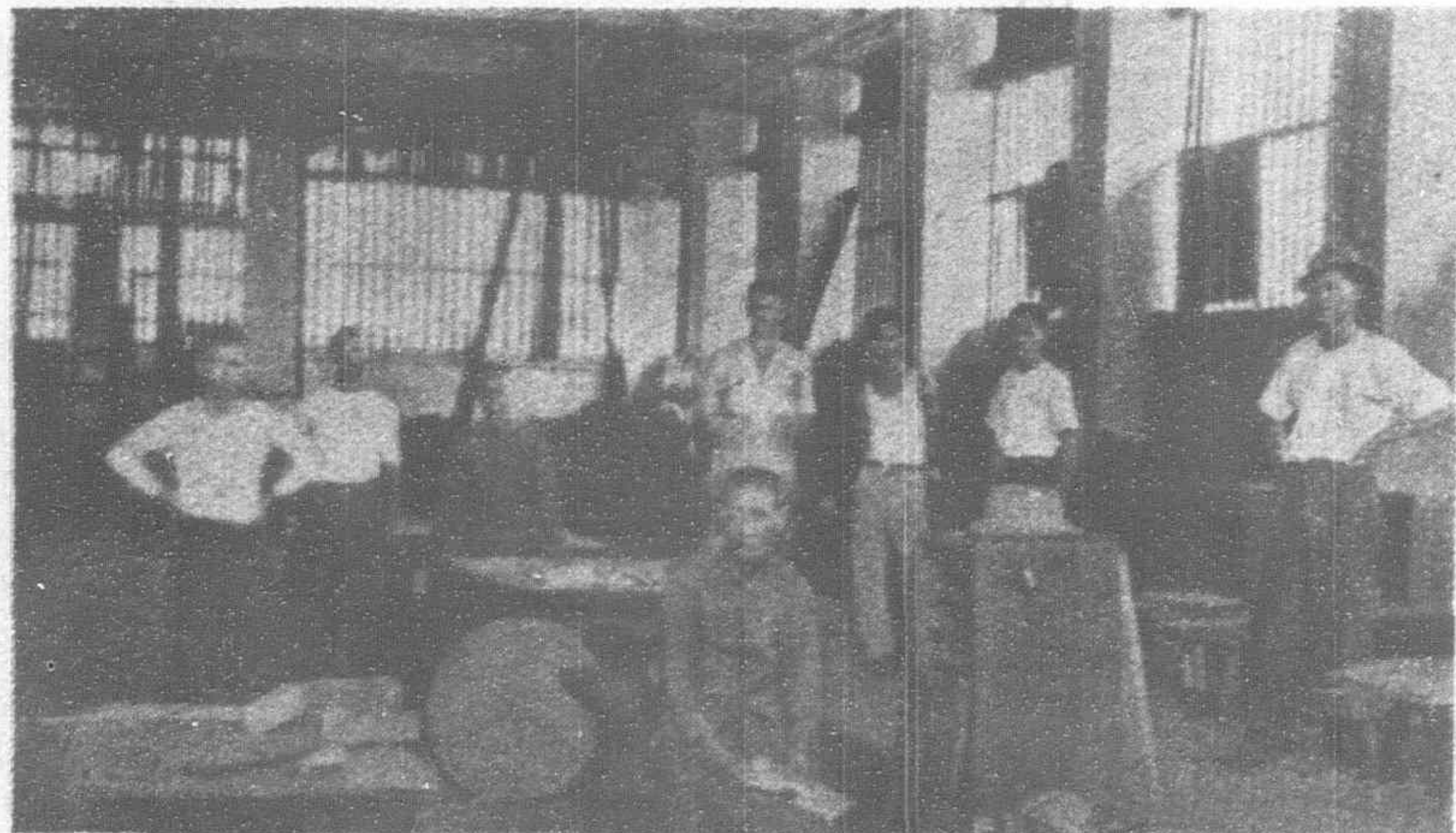
The majority of potential buyers are sufficiently educated to understand and read English, so that, although conditions in Malaya have lately been poor owing to the slump in rubber and tin, there is no justification for machinery suppliers to decrease their allowances for publicity. Assessments based on the present state of trade are to nobody's advantage if they expect to share in the better demand to come sooner or later.

So far as Government and municipal bodies in Malaya are concerned, preference is given wherever possible to British goods; in fact, they insist on this where practicable. As regards the Asiatic buyer price is regarded in the majority of cases before quality. The remedy is difficult to find, especially with the higher prices ruling for British machinery. The remedy lies primarily in reducing manufacturing costs at home, and secondly in having expert salesmen able to convince buyers that it pays to buy the better grade of machinery. The local agent, in co-operation with his manufacturer, should also see that efficient service in spare parts and in attention is available locally.

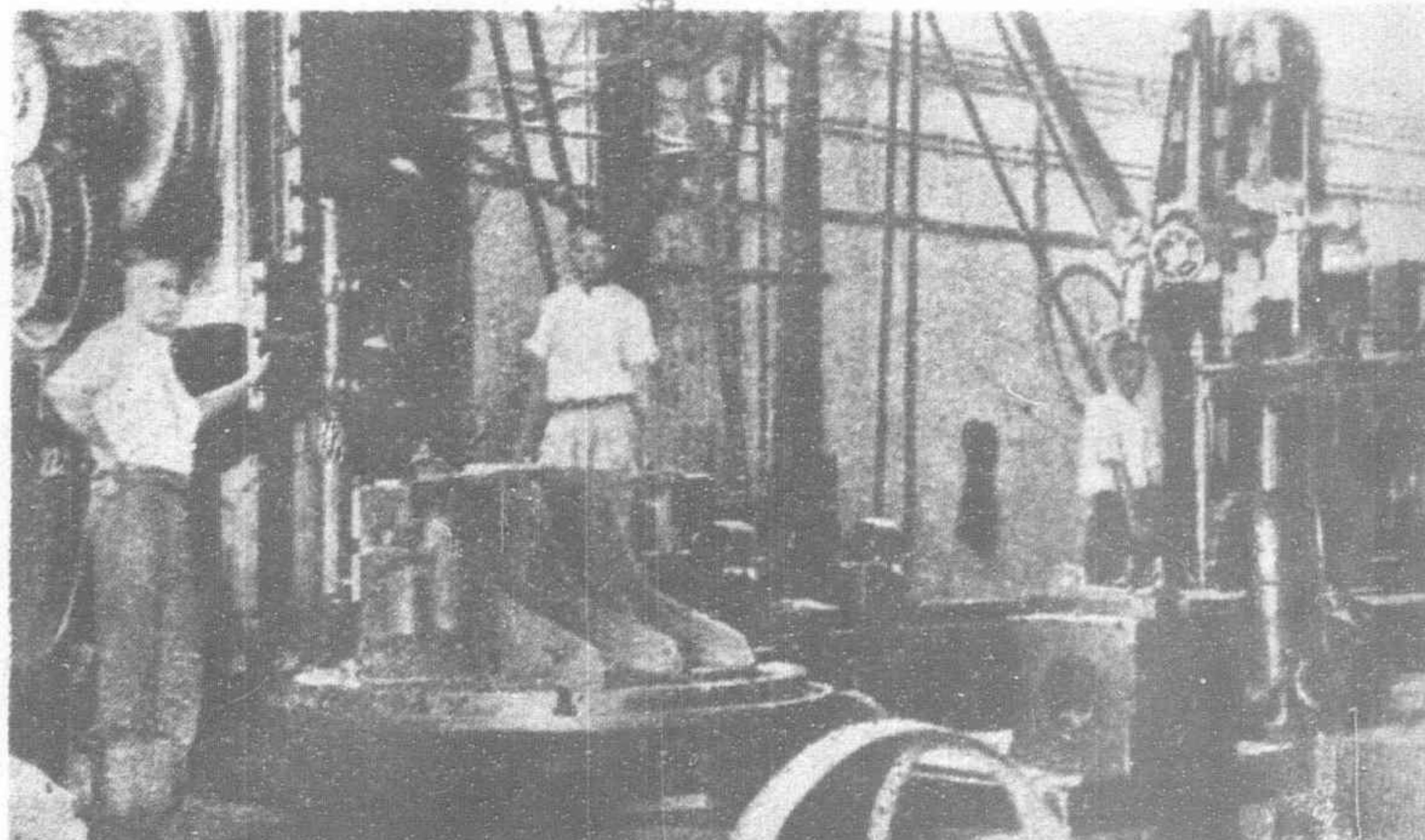
An efficient machinery salesman must be an excellent mixer, both with Europeans as well as with Chinese. The latter constitute the chief element in number and commercial importance in Malaya. He must be able to inspire confidence and must possess a thorough knowledge of the machinery he is handling, both from a practical and commercial standpoint. A working knowledge of the Malay language is a decided advantage. Chinese, owing to the divergence of dialects spoken in the country, is almost impossible for the European to grasp sufficiently well to serve any useful purpose, and so far as Malaya is concerned, is not essential.

Rubber and tin constitute the two chief pillars of Malaya's prosperity. In recent years conditions in these industries have been poor in harmony with those in other countries, and the demand for machinery for rubber factories or tin mines proportionately small. But in normal times, which show evidence of returning, there is quite an important trade in machinery of this kind. In the early days of rubber a common or garden wringing machine was used for making sheet, the coagulated rubber being merely put through it. It was a crude way of treating rubber, but since about 1911 machinery driven by power has been developed and used to an ever greater extent, such as macerating, crêping, and sheeting machinery. In fact, to-day these machines are also made in Malaya, the largest manufacturers being a British concern in Singapore, whose products compare favorably with those made in Western countries.

Latex is taken from the rubber tree and put into a tank, where it coagulates with the aid of acetic acid or formalin. After coagulation, it is put through the machine and made into either crêpe or sheet as desired. All coolie labor is used for working rubber machinery and handling of rubber itself under the supervision of Europeans. Replacements are necessary from time to time, as rollers wear out and have to be regrooved. A sheeting battery of machines comprises three sheeters and a marker, which puts the name and chop (brand) on the rubber and usually has a grooved roller whereby the rubber is ribbed. Such sheeting batteries, as a rule, have rolls six inches in diameter by 18 to 24 inches long. Where a fine crêpe is desired, it has been found advisable to use a heavier battery of machines having rolls 12 inches in diameter and 18 inches long, in order to obtain sufficient pressure.

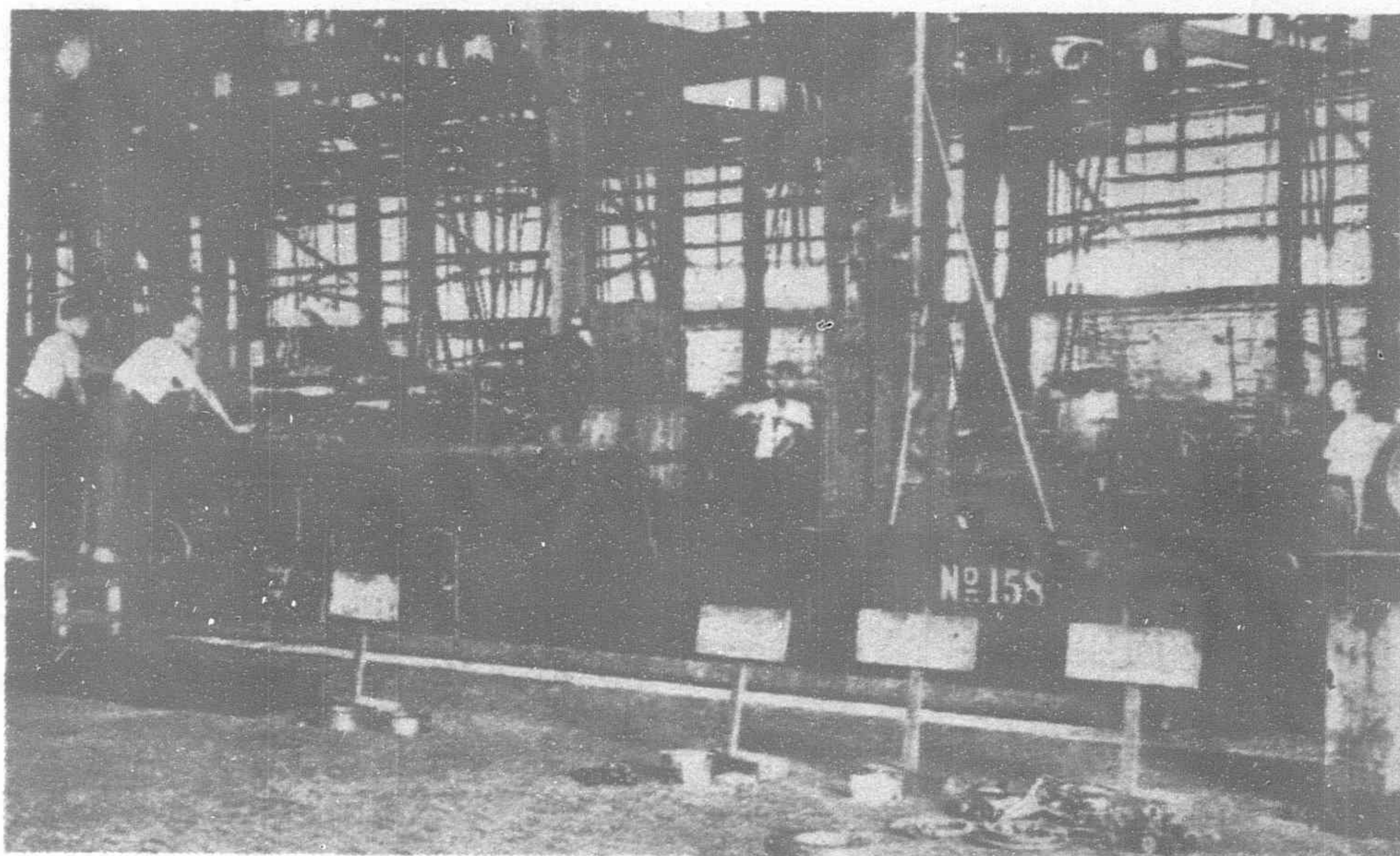


Carpenters' shop of the Singapore Harbor Board



In the workshops of the United Engineers, Ltd., Singapore

A more modern machine for treating scrap bark is a scrap washer. In tapping one gets a great deal of scrap bark from the tree. This used to be thrown away for want of any use to put it to. But to-day scrap bark has become an important by-product for making lower grades of rubber. The scrap rubber is put through a scrap washer, which cleans the bark of impurities and leaves a low-grade lump rubber, which is then put through a heavy battery of grooved machines and made into low-grade crêpe.



A large lathe in the workshops of the Singapore Harbor Board

Machines used in rubber factories are usually run by motive power, an oil engine being nowadays the most general, and the Ruston-Hornby type the most widely used in Malaya in this class of machinery. 50 to 60 h.p. will be required to run a heavy battery of machines, whilst a small sheeting battery requires only 5 h.p. Steam is sometimes employed in the drying room, but the tendency nowadays is to use oil engines for motive power.

In former times, chiefly owing to low cost of fuel (timber), steam engines were universally used in the country, and still are in certain instances where timber is obtained very cheaply. At a later date, a large number of suction gas engines were used, the timber available being turned into charcoal and thereby obtaining low cost of producing gas. As rubber estates opened up and all the available timber was required, it was necessary to look to some other form of power, and this brought in the heavy oil engine. The original heavy oil engine was of the semi-Diesel or low compressive type, but at a later date higher compressive and full Diesel engines became popular in Malaya. The present requirements are high compressive engines, and although the initial cost is fairly high, running costs are fairly low. The big majority of engines for all types of drive are now of the heavy oil type and are in general use here.

The majority of these engines are looked after by native drivers under the supervision of visiting engineers, who received their training locally. With regard to installation of engines, one of the chief points to be considered in Malaya is on what site the machinery is to be erected, as expensive piling may be found necessary owing to the soft nature of the ground. The piles usually used for small work are a local timber called Bakau. For bigger work reinforced concrete is employed.

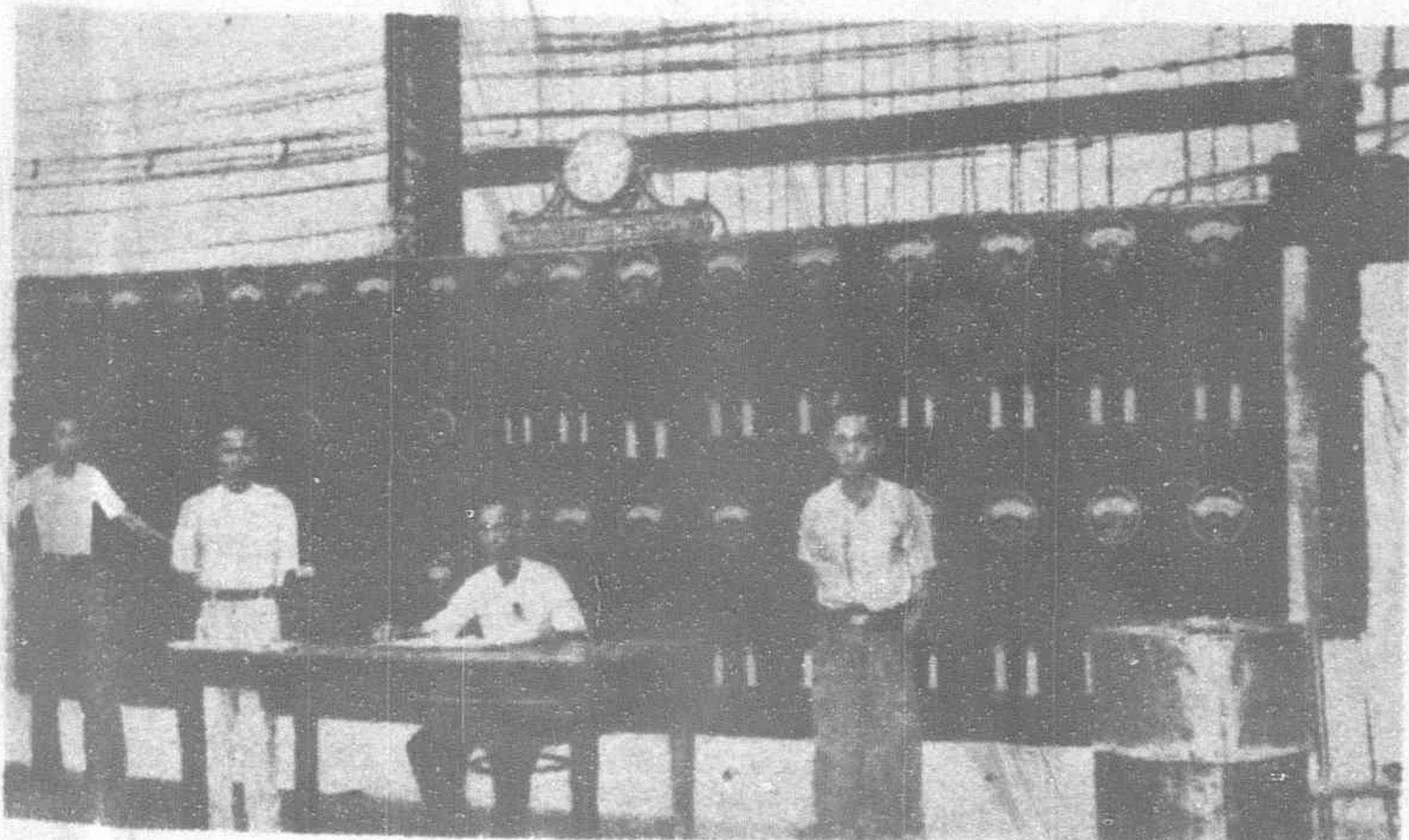
There are not many engineering workshops in Malaya equipped with modern machinery, but the few that exist in the country carry a wide range of machinery. These workshops are owned and con-

trolled by Europeans with expert experience in modern engineering practices, but the labor available and the mentality of the Chinese and Malays render working conditions here and there more difficult than in the West. In the machine shop one has to be most careful to give clear plans to the Chinese workmen. Thus the more time spent in the drawing-office the less time spent on the work. One has to show the various parts of the machine or article to be made in clear dimensions; in fact, to show more or less a picture rather than a

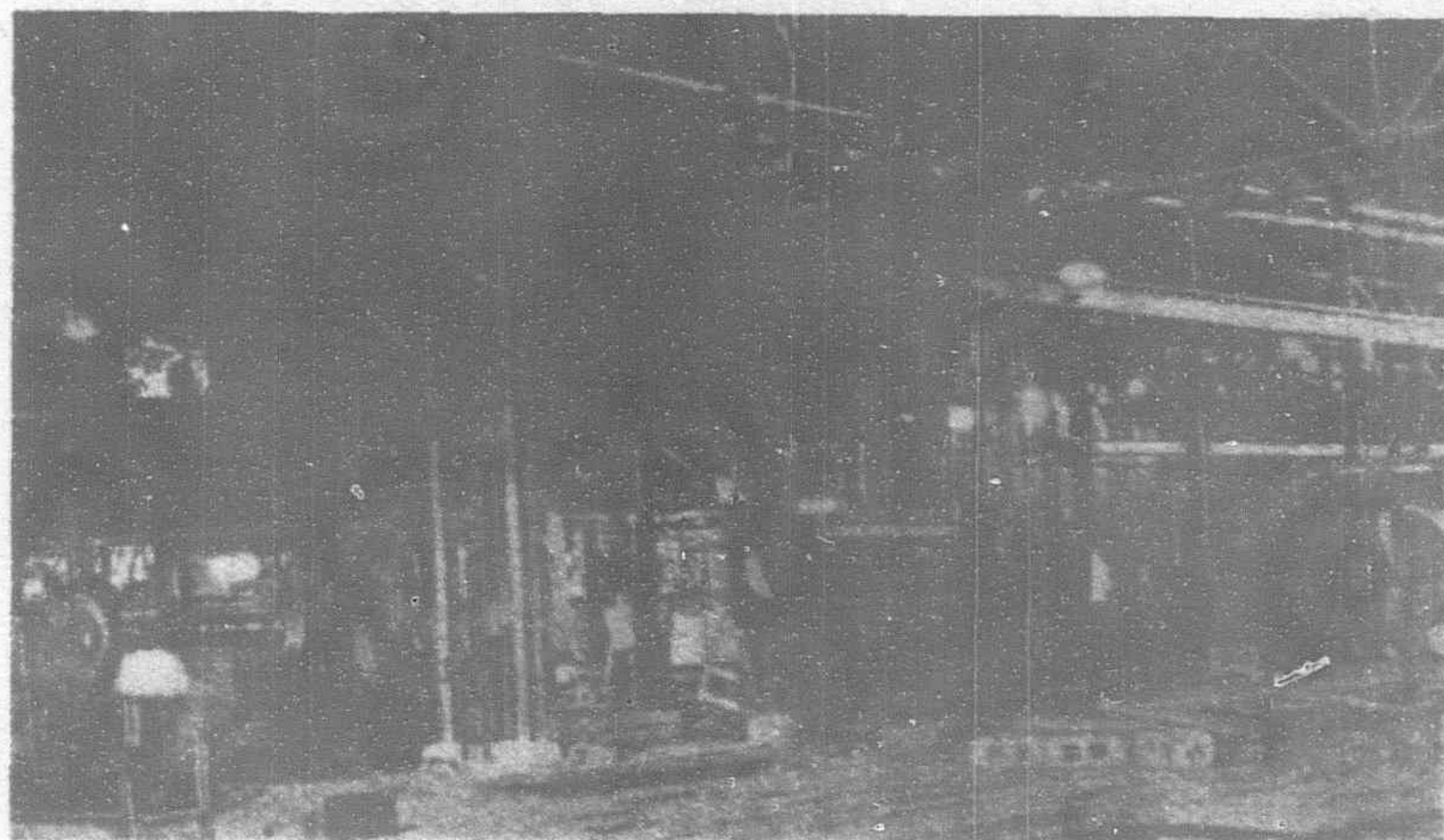
drawing, for a native *does* understand a picture. The same applies to the user and buyer. For instance, a Chinese customer, instead of making a drawing and writing a letter, sent models in wood of a pipe vice, surface gauge, and drill sockets, as he found it difficult to explain what he wanted.

Most of the work done in the machine shops in Singapore, the majority being located in that city, is connected with the tin and rubber industries and shipping. Complete dredges are made and overhauled when necessary by the United Engineers, Ltd., and general repairs effected on other tin-mining machinery, such as gravel pumps, hydraulicing, and oil engines. Singapore is to-day one of eight largest ports in the world, and a great deal of repair work is done on all kinds of steamers, large and small. In Singapore and other parts of Malaya, so far from sources of raw materials, one has to make all kinds of makeshifts in order to accept the varied work brought in and to satisfy everybody. In the case of a difficult piece of work, it is usually a matter of waiting for a new part to be sent out from home or to have it made locally at perhaps a slightly higher cost. As a rule, the customer gets it done in Singapore, not caring or being in a position to abide the delay entailed if ordered out from home.

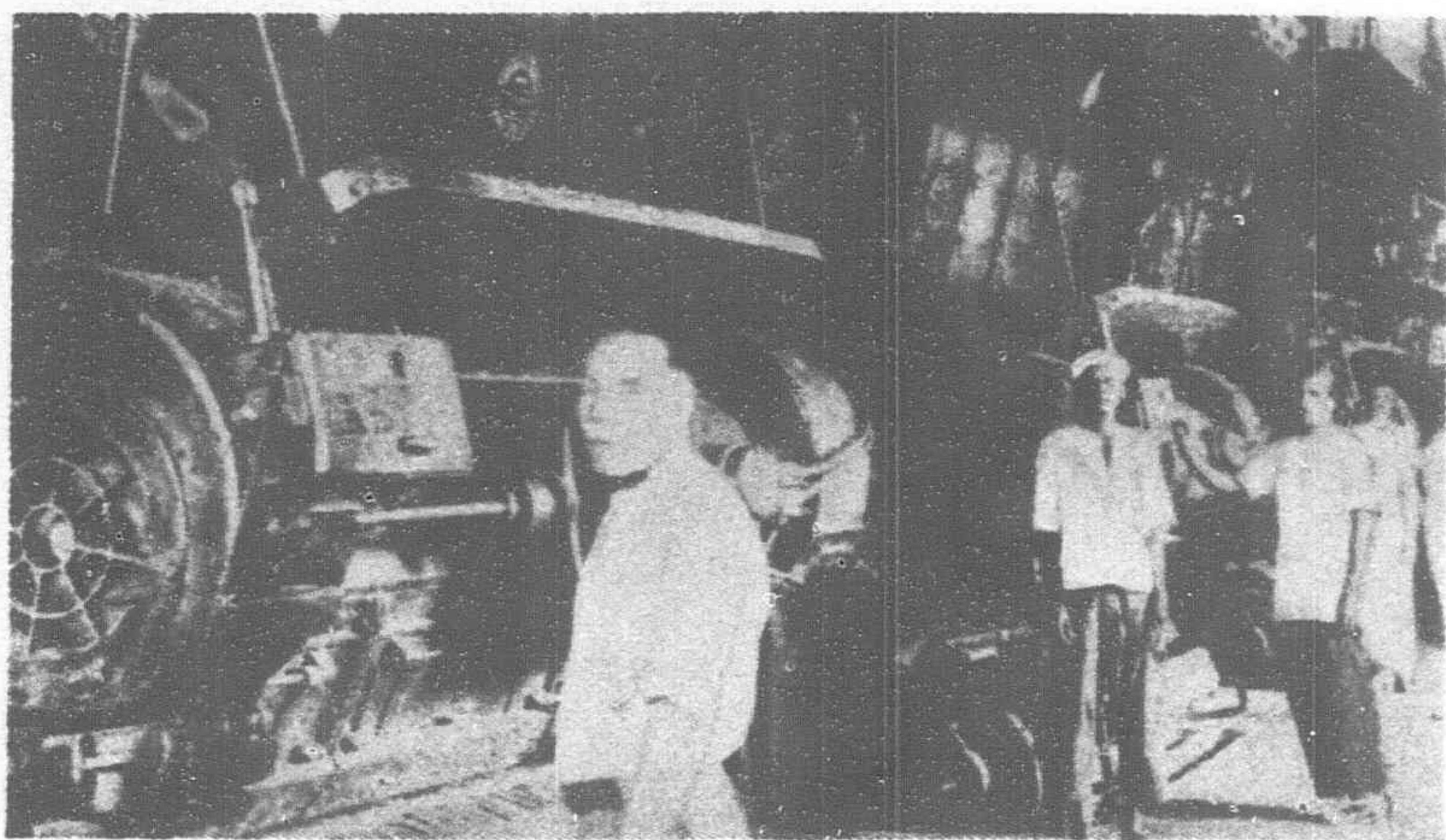
One of the outstanding differences in boiler-shop work in Malaya from Western countries is that it is difficult to get men—as a rule, Chinese—to use pneumatic tools. They prefer, and do use, hand tools in a great many cases where pneumatic tools could be used to better advantage. The average Chinese worker is inclined to be frightened of pneumatic tools, reckoning that there are devils inside them! In some boiler-shops the method of working differs from Western practice. Instead of the company employing labor direct, they have Chinese contractors to do the work at contract rates; the firm supplies power, material and all tools and machines, and the contractors employ their own men in the company's work-boiler shop, the idea being that a Chinese will



Power Station of United Engineers, Ltd., Singapore



Machine shop of the Singapore Harbor Board



Furnaces in the Singapore Harbor Board's workshops

work for a Chinese better than for a European. This is actually a fact. A Chinese does not mind working for a fellow-countryman for longer hours, harder and at lower rates without feeling that he is "losing face," whereas he would not dream of doing the same for a Westerner. In this system of contract work the practice is to show the Chinese contractor a drawing or specification and ask him to quote a price, the work going to the lowest bidder. These men work on the company's premises and may not undertake any outside work. In the boiler-shops of firms in Singapore all kinds of boiler, structural tank and sheet-metal work are undertaken. Work of this nature will probably increase, as steel buildings are becoming increasingly popular in Malaya, chiefly for storage purposes. The steel is imported and made into roofs, roof trusses, uprights, etc.

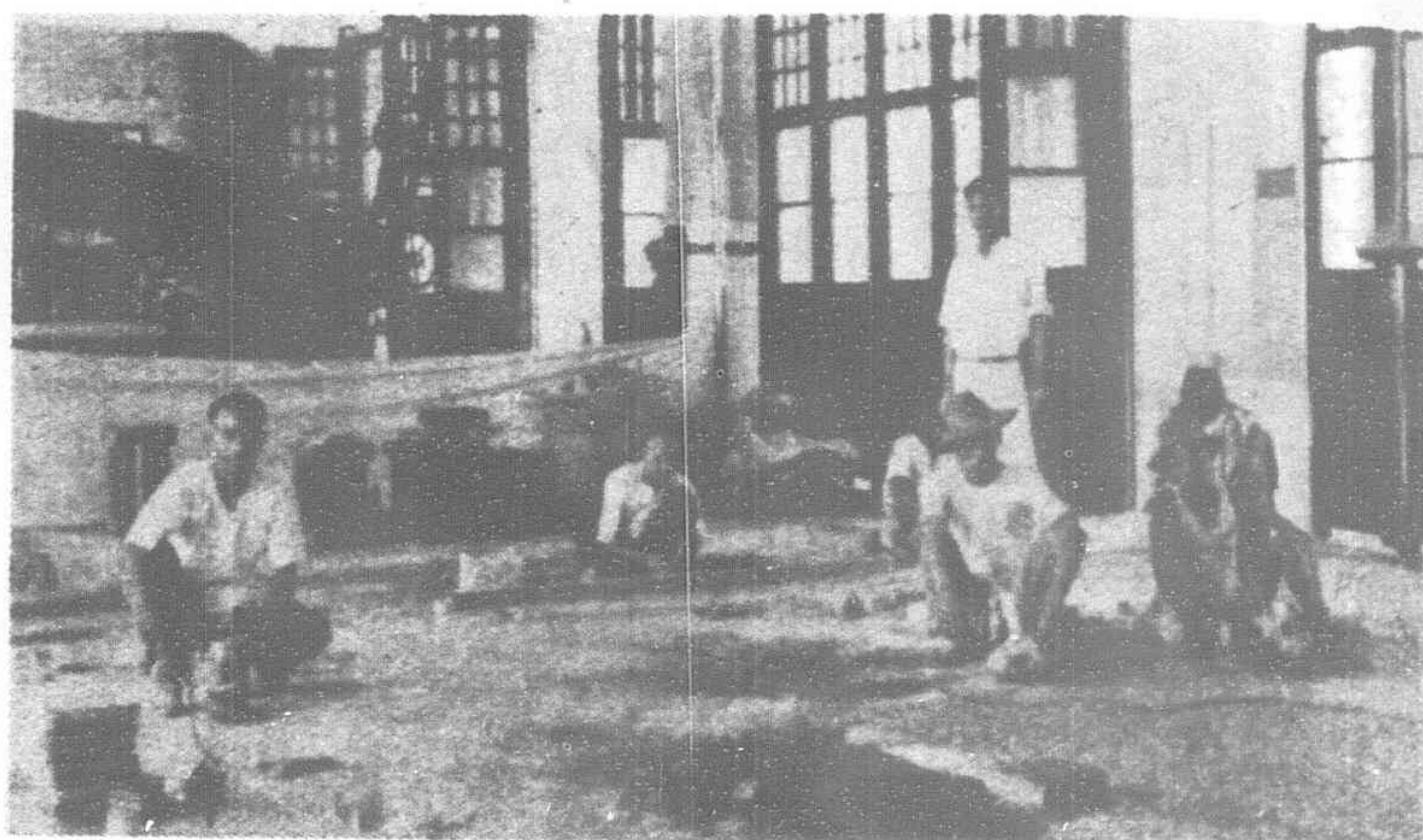
Boilers are not made in Malaya, as firms find it cheaper to import from manufacturers specializing in such work. Most of the work in local boiler-shops, therefore, consists of boiler repairs, and more to land boilers than to marine, though the former are gradually becoming scarcer with the growing popularity of oil engines. To-day, the portable boiler is mostly used in building work, especially in connection with heavy piling. This, in Singapore, and to a lesser extent up-country, is necessary owing to the swampy nature of the country. Steam boilers are used for this purpose quite a lot.

The only concern making tin dredges in Malaya is a British undertaking in Singapore. When a dredge is made, the hulk is constructed in the boiler-shop, as well as jury pontoons, a great many of which have in recent years been made by this firm, following the sinking of a dredge made on the Continent owing to insufficient stability. Since that occurrence, jury pontoons have become in vogue, these being attached to the main hull to increase the stability of the hull.

The men in the boiler-shop start, as a rule, as rivet boys, gradually gaining experience, till they become efficient boiler hands. In many cases the contractors house their men and feed them, but though they do the work it is still supervised by European engineers, and this applies also to work done with pneumatic tools, caulking, etc.

The Chinese are very good at making wooden patterns, but they are all averse to doing anything by mechanical means, preferring to do it by hand. In Malaya, one has to be careful to see that the pattern is cast in the correct metal (iron, brass, aluminium, etc.) and a great deal of supervision is required. Also great care has to be taken to see that white ants do not get into the wood. The wood has to be thoroughly seasoned and placed on racks the legs of which stand in bowls filled with a preparation (such as paraffin) obnoxious to ants.

A peculiar feature of the iron foundry here as compared with that at home is that it cannot have any roof lights—the sun is too strong. Consequently a good system of artificial lighting is usually provided in the larger establishments. Steel foundry work was, until recently, an absolutely new thing to the native Chinese, as a rule, do this kind of work to-day, and as the Chinese has for centuries been used to casting in iron and brass, the process of making steel, when first started in Malaya, was a rather terrifying experience to him. The sparks from the converter struck terror into the coolies, though now they are quite accustomed to them, and the way they handle the work is really very creditable. There



Moulders at work in the United Engineers' workshops, Singapore

is only one steel foundry in Malaya, established about eight years ago by a British firm. Previously, all steel castings had to be imported, but when this concern decided to build tin dredges complete and supply spares for them, it was found essential to erect a steel plant at their works in Singapore. For tin mining, one of the pioneer industries of Malaya, quick repairs to dredges are necessary. A dredge works night and day. Any stoppage due to broken or worn parts is costly. Formerly dredge owners had to carry large stocks of spare parts liable to wear out, but now this is no longer necessary. The local foundry can supply castings in a few weeks, which previously took months to procure from overseas. This firm also executes orders from as far away as Siam, Burma, and even China, the castings ranging in weight from a few pounds to several tons. The methods of manufacture are much the same as in other steel works, but the company has to cope with difficulties peculiar to the Orient. The first of these is, of course, the trying physical conditions. The temperature at any time in the Tropics is hot, but when this is augmented by the furnaces it becomes hardly tolerable. Then there was difficulty with labor; the men—Chinese, Indians and Malays—do not, as a rule, wear footgear. To contend with the sparks from the molten metal, they are now supplied by their employers with heavy boots and have now become quite used to the encumbrance. Very loyal and interested in his work, the skilled Chinese moulder turns out a job of which any man, East or West, could well be proud. When one considers how cheaply they live and how little they are upset by dismissal for bad work, it is surprising they work with such diligence and merit the trust placed in them. They are proud craftsmen and like to turn out good work. The steel foundry in Singapore is in charge of a British chemist and metallurgist, with home training and qualifications, and the quality of its products compares favorably with the best from home.

The variety of work done in the smithy of a large engineering establishment in Malaya ranges from the manufacture of small springs to quite large multiple throw crankshafts for oil, steam and other engines. Supervision and variety of work keep the European very busy, the Chinese being apt to work in their own way, even though they may have been shown a more efficient method. They make particularly good blacksmiths, however, and on small hand-work compare favorably with the best workmen anywhere.

The lathe, which is the basis of all machine work, is in universal use in Malaya. At the lathe the Chinese are good, but inclined to be slow, and generally anxious to make a highly finished job rather than a quick one. Planing, shaping and slotting machines are to be found in the more up-to-date workshops, and all are well understood by the Chinese and efficiently handled. They require more supervision in the use of gear-cutting machines. These have come into greater demand, as more accuracy is required in the manufacture of machinery. Consequently machine-cut teeth are being adopted in gear wheels. In cases where it is difficult to get belt drive, the distance being too short for a belt, machine-cut gears are preferred. There are only two concerns in Malaya able to do machine gear-cutting on account of the expense involved and the difficulty of training the natives to this work. One has actually got to stand over him in work of this nature in order to get a perfect job done. At home, the same work would be done on special machinery, but in Malaya one has to adapt standard gear-cutting machinery to do specialized work, such as bevel-gear

cutting, spirals and worm gears. It is necessary to watch that the Chinese follow exactly the calculations made for them, otherwise the work may be spoilt.

The portable electric tool, such as drills and grinders, are coming more and more into use in Malaya, it being found more economical to take the tool to the job than to take the job to the tool. Firms are gradually eliminating power waste by fitting frictionless bearings to work shaftings and frictionless drives from the motors to the shaftings.

Electric motors are now in universal use. Ordinary running repairs, including rewinding, are effected locally, the only firm having a special department supervised by a European binder for work of this nature being a British concern in Singapore. The great trouble in Malaya is humidity coupled with temperature gives great trouble, hence it is important that manufacturers of motors should take special care that the insulation is of the best. They should bear in mind that enamelled wires do not stand this climate and to obtain complete reliability double silk-covered or double cotton-wire must be used. To supply standardized goods is all very well, but what is good in Europe or America is no good for the climate of Malaya. A cause of half the troubles experienced when motors and dynamos were introduced was over-oiling of the bearings, which made the oil to run into the carcass and soak the coils. In one instance the owner complained of the dynamo giving no light. When the machine was inspected it was found that the commutator and brushes were soaked with oil, the native in charge having thought they ought to be oiled! Another trouble was due to want of cleaning. At first, also, some of the switchgear from home was not altogether suitable, so clearances from "live" parts to metal casings had to be increased. Troubles were experienced on switchboards, due to spider webs; these got damp, metallic dust was caught in them, and sometimes a flash-over resulted. Many things happened, which never could at home, in the early days of electrical engineering out here.

Radio on Chinese Steamers

With a few exceptions, all sea-going passenger vessels and freighters of more than 1,600 tons are required to instal radio stations under regulations recently adopted by the Legislative Yuan. Vessels which are exempted from installing radio stations include:—

- (a) Passenger steamers plying not more than 20 nautical miles from the shore and those whose route between coastal ports does not exceed 200 nautical miles.
- (b) Freighters of less than 1,600 tons which do not ply beyond 150 nautical miles from shore.
- (c) Junks and vessels of simple structure not intended for deep-sea navigation.

The Government will exercise strict supervision over radio installations on ships. Any individual or company which intends to instal a radio station on a vessel must first apply to the Ministry of Communications for approval. No radio station may be operated until a licence has been granted by the Ministry. Such licence must be renewed every five years, the fee being \$5; for each subsequent renewal a fee of \$2 will be charged.

Steamers plying in internal waters may also, whenever necessary, apply for permission to instal radio stations.

One of the regulations requires all radio operators on ships to be Chinese citizens, holding certificates of competence issued by the Ministry of Communications.

While radio stations on ships are prohibited from injuring the business of any telegraph organ on land, they are allowed to receive and dispatch radiograms and charge fees therefor.

Furthermore, all radio stations are to be subject to examination by the Ministry of Communications. No fee, however, will be charged for such examination.

For violations of the Regulations, fines ranging from \$200 to \$300 will be imposed. In case an offender derives any profit from illicit radio communications, such profit shall be confiscated.—*Chinese Economic Bulletin.*

Some Tin Deposits of the Burma-Malayan Peninsula

(Continued from page 303)

The association of tin mineralization with minor intrusions of the type described seems to the author to possess more than local significance and to be of the greatest importance in the guidance of prospecting and in the explanation of the genesis of many occurrences. The abundance of domical structures may, it seems to him, be the source of the tin accumulated in the Kinta valley of the Federated Malay States, while their decreasing frequency helps to explain the mineral impoverishment resulting northwards from Malaya through Siam to Burma.

As the result of his work in this part of the world the author would like to stress two important facts. First, all water-formed, secondary deposits of cassiterite, one mile or farther from the primary occurrence, accumulate only by the "roll" or "creep" of gravels, pebbles, or boulders, which protect the mineral while retained within its matrix. When passing through the mills of nature the liberated "free" cassiterite on its streamborne journey will not travel one mile, owing to its rapid comminution or early gravitation to bedrock. Secondly, many occurrences of the Burma-Malayan tin provinces only simulate alluvially-formed deposits, the cassiterite present being angular or sub-angular. Some of these occurrences contain boulders that show signs of attrition or absorption, while others contain veins and stringers of quartz. The author suggests that occurrences of this type are primary and that their sources are inconspicuous minor intrusions, with the igneous rock deeply destroyed by tropic waters.

A study of the available literature shows the relation of the simple type of mountain structure to cassiterite occurrences. In the geology of the Caracoles district of central Bolivia it is shown that* "The slates appear to dip away from the central granite, so that the mass is somewhat similar to a laccolith—that is, body intruding into and bulging up the sediments." The tin deposits of Tanganyika Territory are† "thrown into a series of complicated folds and domes and are also intruded and metamorphosed by granite." For East Africa‡ "the topography of the tin areas is the presence of more or less circular areas of undulating country, surrounded by high ranges of hills. So common is this arrangement that the occurrences are referred to as arenas." At Zinnwald§ "numerous narrow seams and beds of ore occur in a dome of altered granite (greisen) which is intruded in porphyry. The seams are nearly parallel and approach the horizontal." In Cornwall¶ "all the granites are very similar in their characters and relations and there can be no doubt that they are all local domes or cupolas on the surface of a great batholith that underlies the whole district at no very great depth."

The Kinta valley of Malaya, the world's largest tinfield, presents a tangled geological problem, the natural history of so many of its occurrences being only partly unravelled. The mineral values occur in "stockworks" of the sedimentary series, as veins in the flanking granite of the Kledang and the Main Range, in pipes through the limestone, and, in the author's opinion, as mineral contained in inconspicuous minor igneous intrusions altered by tropical weathering and masked by the effects produced probably by marine erosion.

*Waldemar Linggren. "Replacement of the Tin Bearing Veins of Caracoles, Bolivia."

†E. O. Teale. "Tanganyika Territory," *The Mining Magazine*, August, 1928.

‡W. L. Webb. "The Tin Areas of East Africa," *The Mining Magazine*, August, 1927.

§J. P. Wallace. "A Study of Ore Deposits."

¶R. H. Rastall. "The Geology of the Metalliferous Deposits."

Dnieprostroy Generators Exceed Their Guarantees

(Continued from page 309)

The 77,500 kva. hydroelectric generators at Dnieprostroy are the largest of any type now in service. Each has a total weight of approximately 1,760,000 pounds; and the weight of the rotor and shaft is about 980,000 pounds. The maximum diameter of the generator is 42 feet, and the overall height 40 feet, 5 inches, with 17½ feet extending above the floor of the plant.

The Reyrolle Portable Earth Tester

THE efficient earthing of the metal casings surrounding electrical apparatus in factories, workshops, power-stations, substations, and other places coming under the supervision of the Home Office has been required in the Electricity Regulations for a number of years, and the importance of earthing in other installations is being increasingly recognized, as is shown, for example, by the relevant part (such as Regulation 1005) of the Tenth Edition of the I.E.E. *Regulations for the Electrical Equipment of Buildings*.

The objects of earthing are several, and will best be understood by reference to the diagram in Fig. 3 of a typical installation connected to a three-phase four-wire alternating-current supply, which is now practically standard. The consumer's apparatus is protected by means of fuses or over-current devices, and the metal casings are bonded together and connected to an earth-electrode, this being what is usually referred to as the "solid earth system" of protection.

One of the objects of earthing is to avoid a high stray-voltage between a metal casing and the general mass of the earth, and for this purpose the resistance X between the consumer's earth-electrode and earth must be kept low.

Another object of earthing is to conduct away safely to earth any small and harmless earth-fault currents that may arise, and, further, should such currents exceed a specified limit, to interrupt the supply to the faulty point altogether. The limit is set by the fusing-current of the fuses or the setting of the over-current devices; and earthing is "efficient" only when the impedance of the complete earth-circuit (i.e., the circuit in which the leakage current would flow in the event of an earth-fault) is low enough to permit the flow of sufficient current to blow the fuses or operate the over-current devices. This implies that the impedance of the earth-circuit, to be appropriate, must not exceed certain values depending upon the rating of the circuit. If this condition is complied with, it is safe, in practice, to assume that the resistance X , which forms part of the complete earth-circuit, is also sufficiently low to avoid any high stray-voltages; and consequently, in testing for the efficacy of earthing, it is sufficient to measure the impedance of the complete earth-circuit only.

It may be noted in passing that it is not always possible to protect a circuit against earth-faults by means of fuses, because in circuits of high current-rating it may be impossible to secure a low enough earth-resistance. In such circumstances, or, broadly speaking, whenever adequate protection cannot be obtained by the solid earth system (for example owing to excessive earth resistance), some alternative earth-leakage protective device (such as a switch fitted with core-balance protection, or an earth-trip switch) must be used.

Obviously, in view of what has just been said, the earth-circuit is of very great importance, and it is now generally agreed that the mere connection of the metal casings to an earth-electrode does not necessarily constitute sound earthing. It is clear that

the impedance of the earth-circuit not only must be low enough when it is first installed, but must also remain at a suitable value if the protection is to be permanent. To ascertain whether or not this is so is obviously only possible if the impedance is measured from time to time, and so checked against the value known to be safe.

The Portable Earth Tester

Although the efficacy of earthing may be tested by testing each section of a complete earth-circuit separately, such a method is cumbersome and is unsuitable in practice either for the initial testing of wiring and equipment on the completion of its installation or for maintenance-testing. Our study of the problem during a number of years has enabled us to evolve a Portable Earth Tester, by means of which it is possible not only to check the continuity

and resistance of the local earth-wiring in a consumer's premises but also to measure the impedance of the complete earth-fault circuit from the remotest point of a system, say the metal casing of a portable appliance, right back to the supply-neutral earth-electrode. Thus, by the use of this instrument, without carrying out laborious and costly tests, anyone responsible for an installation can ascertain quickly and accurately at any time, either initially or as a matter of routine, whether the earthing is sound.

The Tester can be used for all industrial, domestic, and rural installations in which a low-voltage alternating-current supply is available with its neutral wire earthed at the supply substation. Since this is the standard method of distribution, the sphere of usefulness of the Tester is practically unlimited.

Principle of Operation of the Tester

The Tester contains an indicating meter connected in series with a resistance and calibrated in ohms on the basis of a standard voltage. By plugging the Tester in to the nearest socket or lamp-holder, and touching the metal casing

of the apparatus under test with a wander-contact, the meter is connected in the earth-circuit and a low potential is applied to the casing, so that a current traverses the earth-fault circuit, and the impedance of this circuit in ohms is indicated on the meter scale.

Details of the Tester

The Tester, which is contained in a polished wooden case measuring about nine inches each way, comprises, in addition to the indicating meter, a small step-down transformer, a polarity-indicating neon lamp, calibrating-resistances, fuses, testing-switches, testing-leads, a dry battery, and a flexible cable with a special adaptor capable of being plugged into a 5 ampere socket, a 15 ampere socket, or a lamp holder. The flexible cable and the testing leads are conveniently housed in a hinged compartment on the underside of the case, and a metal spider is provided



Fig. 1.—The Portable Earth Tester

to wind them on. The cable is long enough to enable tests to be made up to 45 feet from a supply point, or between two points on the earth-wiring up to 40 feet apart.

The standard Tester is supplied for voltages from 200 to 260-volts. Model "U" (Urban), with a range from 0 to 100 ohms, is usually supplied, but Model "R" (Rural), with a range of 0 to 500 ohms, or Testers for voltages different from the above, can also be supplied. Each instrument, before being put into use, is adjusted to suit the supply-voltage it is intended to work on, but even if this varies, satisfactory readings can still be obtained by using the calibrating-resistance. This calibrating-resistance also enables satisfactory readings to be obtained when the potential of the neutral wire is above that of the earth. The adjustment is made in a few seconds prior to taking an actual test-reading, with the testing-switch in the *Calibrate* position, by turning a knob attached to the resistance until the meter shows full-scale deflection. Calibration before each test compensates for variations of the kind referred to, and makes it unnecessary to know their amount, or to take them into account directly at all.

Uses of the Tester

Fig. 5 shows a simplified circuit diagram of the Tester and its application for measuring the impedance of a complete earth-fault circuit similar to that illustrated in Fig. 3. To make the test, the Tester is plugged in to

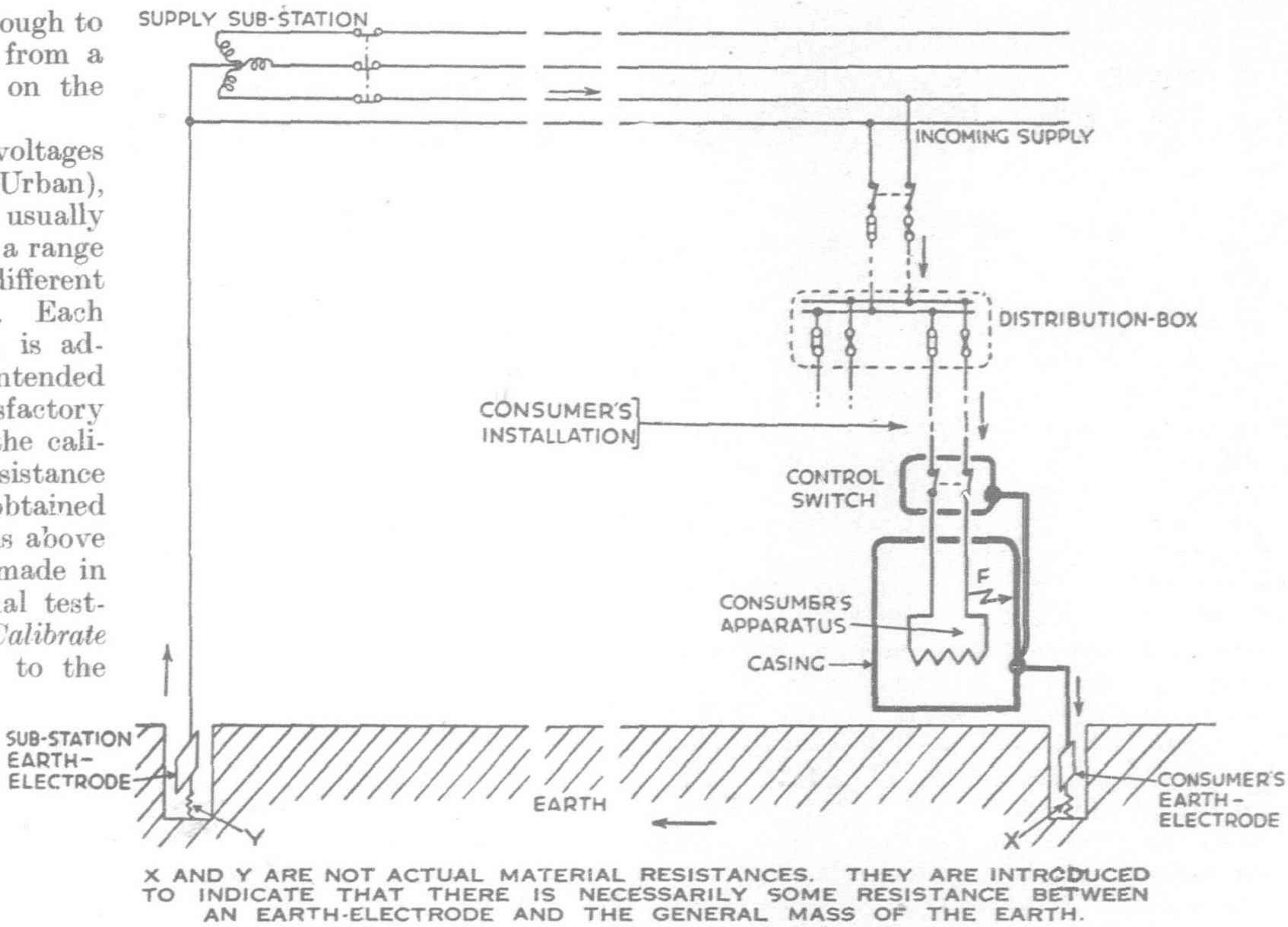


FIG. 3. DIAGRAM ILLUSTRATING THE SOLID EARTH SYSTEM OF PROTECTION. ARROWS INDICATE THE PATH OF FAULT-CURRENT DUE TO A FAULT AT F ON THE CONSUMER'S APPARATUS.

the nearest alternating-current supply-point, and the wander-contact is clipped to the metal casing of the appliance under test. If the polarity of the wiring is correct, a current of a few



Fig. 2.—The Portable Earth Tester in use in a factory. Such tests can be made in a few moments, frequently without any interruption of work at all



Fig. 5.—A test being made of the Earth-Circuit of a Domestic Consumer's Appliance

milli-amperes flows to earth from the live wire through the neon lamp and the switch S, which is normally in the position shown in the diagram. If the neon lamp does not light, the polarity of the wiring is incorrect, and the supply to the Tester must be reversed by reversing one of the plugs. The switch S is then put over to the *test* position, and this connects the 30-volt winding of the transformer into the circuit, so causing a current to flow through the meter, the wander-lead, the earth-continuity conductor, the consumer's earth-electrode, the sub-station earth-electrode, the neutral conductor, and back again to the neutral connection of the 30-volt winding; and the impedance of the circuit can then be read. The fact that the circuit traversed by the testing-current differs slightly from the earth-fault circuit, in that the neutral conductor is substituted for the live conductor, is of little importance, since in practice the impedances of these two conductors are frequently equal, and even if they are not they form a small proportion of the total impedance.

In addition to testing the impedance of the complete circuit,

it is also possible to measure the resistance of the earth-continuity conductors between any two points, for example between the metal casing of the apparatus under test and the earth-electrode. This may be done with alternating current as before, or with direct current obtained from the dry battery included in the Tester, and it enables a defect in the earth-wiring to be located if it has been shown to exist by the test of the complete circuit, or to check the resistance of the earth-wiring after an installation has been completed, but before it is connected up to the supply.

Although the foregoing description has dealt with the Tester solely in its relation to earth-circuits, it will be clear that it is capable of being used generally as an instrument for measuring resistance, and thus its field of application is a remarkably large one. It has, indeed, other possible uses apart from the measurement of resistance as such; for example, it may serve to indicate whether the polarity of the wiring to a socket is in accordance with the I.E.E. Regulations, that is to say whether single-pole switches are in the live side of the supply-conductors.

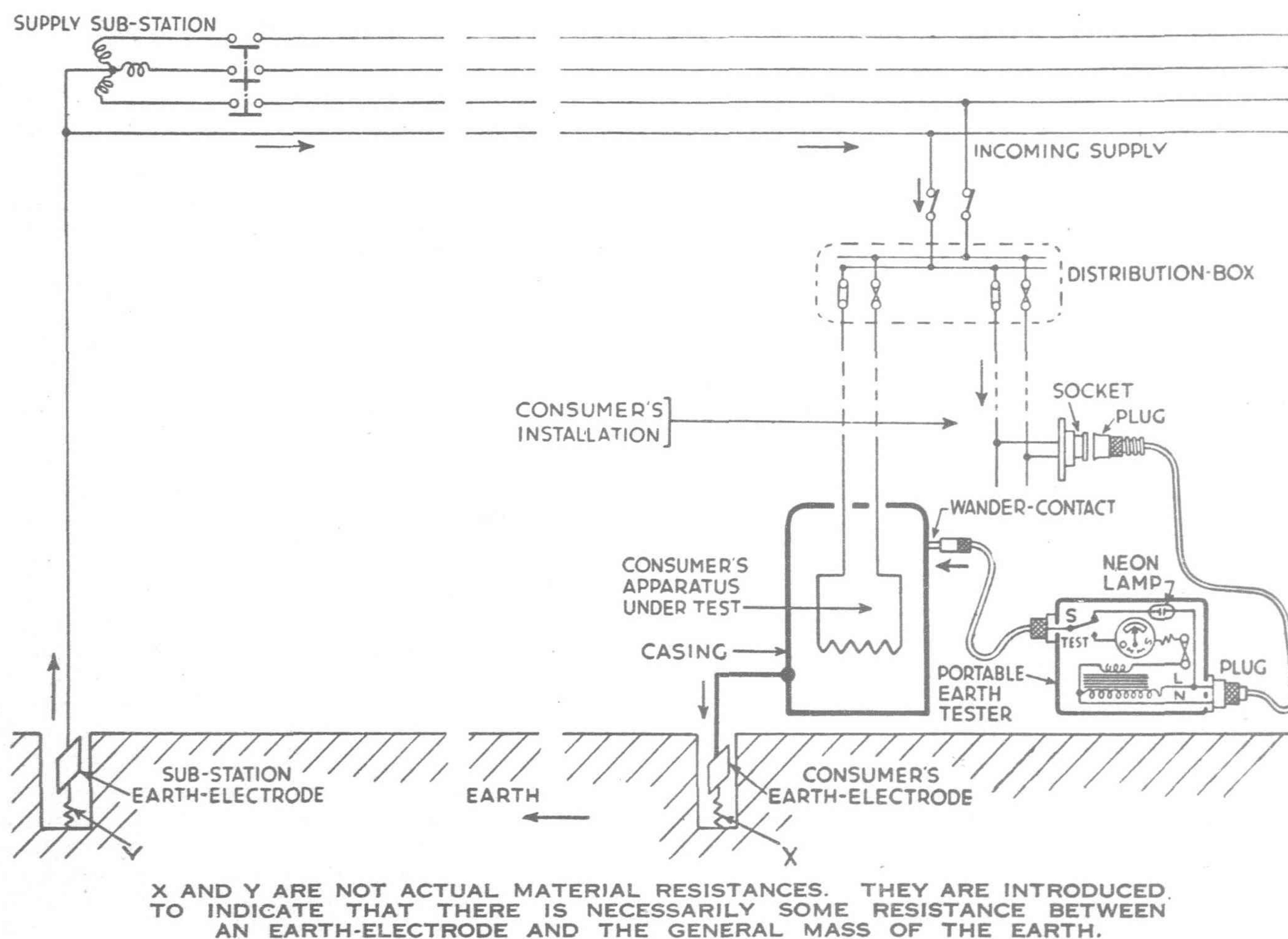


FIG. 4. DIAGRAM SHOWING THE APPLICATION OF THE PORTABLE EARTH TESTER TO MEASURE THE IMPEDANCE OF A COMPLETE EARTH-FAULT CIRCUIT. ARROWS INDICATE THE PATH OF TESTING-CURRENT.

RASHIN TO MODERNIZE FACILITIES

The sum of Y.2,651,000 will be the total appropriation for town building at Rashin according to information from Rashin.

Construction will be commenced in April, when the new 1935-6 fiscal year begins, on a three year program. It is expected that a modernized and neat town will make its debut in three years, in the northern remote corner of Chosen.

According to the present plan, the town of Rashin will cover an area of approximately 10,000 acres. The laying out of about 700 acres is included in the first year program, with the railway station for the center.

Of the total appropriation, Y.506,000 is to be given as subsidy by the Japanese government, while the remaining sum of 2,145,000 will be borne by land owners and the townfolk.

In view of a municipal system being introduced at Rashin on the completion of town planning, authorities of the town propose to build a municipal office on an up-to-date design. The site for the edifice has been chosen on the second circle designated in the town planning. The office building will cost Y.300,000.

Meantime, the population in the town is rapidly increasing. The education of illiterate Koreans who are thronging to the port is now a grave question requiring urgent solution.

The town of Rashin has now its post office and automatic telephone exchange. The opening ceremonies were held on March 21.

There is a cinema hall named the Tokiwa-kan which was also opened on March 21. This, which is the only amusement resort can accommodate 800 persons.

Colombo Port Improvements

THE future development of the Port of Colombo is discussed in a memorandum by Mr. A. N. Strong, Chairman of the Colombo Port Commission.

"The only definite proposal at present under consideration," the memorandum states, "is the construction of two quays, an oil dock, and a basin, immediately to the north of the Graving Dock in order to provide much needed facilities for the discharge and loading of petrol, kerosene and liquid fuel, and a refitting berth."

"The construction of a Deep Water Wet Dock is still, as it has always been, a future possibility and has so far not got to the stage of a definite proposal."

As regards Port Dues, the memorandum gives comparative figures to show that the charges in Colombo compare very favorably with the charges in Bombay, Karachi, Calcutta and Rangoon.

A special sub-Committee of the Commission, the memorandum states in conclusion, has been going into the question of the costs of bunkering coal, and "the question is at the moment being considered whether the popularity of Colombo as a coal bunkering port could not be increased by some reduction in costs, including the port charges imposed upon vessels entering to land or bunker coal."

"This sub-Committee is also reviewing the entire scale of charges both on vessels and on cargo and will shortly be in a position to make definite recommendations with a view to maintaining and increasing the popularity of Colombo as a port."

The Memorandum

The following is the text of the memorandum :—

There appears to be an impression that Port dues in Colombo are already too high, higher than in other Eastern ports, and ought to be reduced. This is evidently due to some misunderstanding, for the fact is that Port dues in Colombo compare very favorably with other ports. For example a cargo vessel of 6,000 tons would in Colombo pay by way of entering dues, pilotage, mooring charges, etc., about Rs. 573. A similar vessel in Rangoon would for the same services pay at least Rs. 2,702; in Bombay Rs. 1,630; in Karachi Rs. 1,628; and in Calcutta Rs. 1,992. A fairly large liner of 14,000 tons would in Colombo pay Rs. 1,729, compared with Rangoon Rs. 5,952; Bombay Rs. 3,575; Karachi Rs. 3,666; and Calcutta Rs. 4,568. It is, therefore, safe to say that, even admitting that certain improvements in Colombo are desirable in order to keep pace with competition, these can hardly be looked for in the direction of any appreciable decrease in port dues, which are by comparison with other ports obviously on the light side.

Proposed Oil Dock

Owing possibly to the absence of any authoritative statement on the subject, a certain amount of misconception appears to prevail as to the future policy of the Port Commission with regard to the provision of a Wet Dock. The only definite proposal at present under consideration is the construction of two quays, an oil dock, and a basin, immediately to the north of the Graving Dock in order to provide much needed facilities for the discharge and loading of petrol, kerosene and liquid fuel, and a refitting berth. The oil bunkering trade in Colombo has of recent years increased by leaps and bounds, and the present facilities are notoriously quite inadequate. There is at present room for only one vessel at a time at the Guide Pier, and the berth is so situated as to preclude access to the Graving Dock, with the result that if a vessel has to enter or leave the dock either that vessel is delayed or any oil tanker which may happen to be working has to stop work and go back to moorings while docking operations are taking place; at certain times of the year when the dock is in frequent use for refitting H.M. Ships and mercantile vessels, great inconvenience and delay are caused.

For the Safety of Shipping

There is also the further question of the safety of shipping. In all ports every endeavor has been made to confine the handling

of dangerous petroleum from or into tankers to an area which is as far removed as practicable from the vicinity of other shipping. In Colombo this precaution is lacking, and the authorities are not at all satisfied, in the interests of the safety of the port, with the present arrangements. From the point of view, therefore, both of safety and of adequacy of facilities, further accommodation for tankers is an urgent necessity, and it is believed that this urgency is recognized by all concerned. The present proposal, therefore, is to construct an oil dock in order to provide safer and more adequate facilities for tankers. The basin will provide increased facilities for re-fitting vessels the present facilities being quite inadequate and forming a definite discouragement to the use of the Port for this purpose.

Wet Dock Scheme Explained

The construction of a Deep Water Wet Dock is an entirely different matter; it still is as it has always been, a future possibility and has so far not got to the stage of a definite proposal. This wet dock is commonly supposed to be in some way connected with the landing of passengers, etc., straight on to dry land, instead of through the intermediary use of launches. The real position, however, is as follows:—The present water area of the port of Colombo is roughly one square mile—to be exact 643 acres, containing accommodation for 40 vessels during the South-West Monsoon and 36 vessels during the North-East Monsoon. Before the depression set in, the accommodation of the port was on occasion somewhat severely taxed, and for years past the harbor authorities have been casting their minds forward to the possibility of the accommodation being found inadequate to deal with increasing traffic. In such an event it might be necessary seriously to consider the extension of the water area of the harbor, in order to accommodate the demands of increased tonnage entering the port. It is clear that this extension cannot take place seawards; the alternative therefore is to extend inland; and after full consultation with the Consulting Engineers in London, it has been agreed generally that the extension should take the form of a channel leading from the harbor inland and expanding into a wet dock, with alongside accommodation. It should, however, be clearly understood that such an extension is not an immediate concern and will only be considered as a definite plan if and when increasing traffic throws a strain upon the present accommodation of the port which it is unable to meet.

This wet dock scheme is in no way connected with the construction of the oil dock and basin at present under consideration, though it does in a sense form an extension of the latter in that, for reasons of economy, the entrance to the wet dock would be through the basin. But the two schemes are independent of each other, and the construction of the oil dock, quays and basin in no way commits the port to the further construction of a wet dock.

Not for Passengers

One of the main uses to which the wet dock would be put, with its alongside accommodation, would probably be the landing of rice and the landing and shipping of coal. The present methods of handling rice involve manual labor at all stages between the vessel and the warehouse, and the transfer of the grain to the Chalmers Granaries by antiquated bullock cart transport which crosses one of the busiest lines of the City traffic. The discharge and bunkering of coal are still done by hand, and in this respect Colombo has much to learn from other ports; rail access to a quay, alongside which a vessel can lie, would probably prove a great improvement on the present methods of handling coal even without any elaborate plant for mechanical handling. Even if a wet dock were constructed, it could only accommodate a few vessels at a time, and would not materially affect the present methods of handling cargo, namely, by lighter, nor would it appreciably affect the present system whereby passengers are landed at the jetty, for it is not proposed to land passengers at a spot far removed from the Port.

Another point which has been raised is the cost of construction of a wet dock. There appears to exist a general assumption that shipping will have to pay for any improvement to, or expansion of, the Port. But so far as the Port Commission is aware, the question of cost has never been discussed, and it is at the least premature to assume, especially when every effort is being made to attract and not to discourage shipping, that shipping alone will have to bear a charge which could, and might justifiably be met by the general taxpayer whose asset, in the Port, would thus be enhanced in value. In any event the Port Commission considers it unnecessary to confuse the issue by premature speculation on this aspect of the question, which will doubtless be fully considered and discussed before any definite step is taken in the direction of expansion.

Sub-Committee's Enquiries

Further attention has been drawn to the shortcomings of Colombo as a coaling port, but the Port Commission is entirely alive to the position. There is little doubt that Colombo is losing its popularity as a coal bunkering port, and compares unfavorably with several of its competitors both in the rate of handling and in the charges for labor, rent and Port duties. This question has been under consideration for some time by a special Sub-Committee of the Port Commission, which has been going into the matter of costs generally, but it must be remembered that the cost of coaling is not entirely within the control of the Port Commission; for example, the cost of labor cannot be regulated by anything the Commission can do, though Port dues, which also affect the question, are a matter in which the Port Commission has some say. Full enquiries have been made, and the question is at the moment being considered whether the popularity of Colombo as a coal bunkering port could not be increased by some reduction in costs, including the port charges imposed upon vessels entering to land or bunker coal.

This Sub-Committee is also reviewing the entire scale of charges both on vessels and on cargo, and will shortly be in a position to make definite recommendations with a view to maintaining and increasing the popularity of Colombo as a port.

Tokyo-Singapore Air Line Planned

WITH a decision definitely reached to inaugurate air service between Japan proper and Formosa next January, and with the newly-established daily service between Japan and Manchuokuo actually functioning, the possibility of extending the southern line to Singapore is under discussion. Officials of the Japan Air Transport Company and the Aviation Bureau in the Ministry of Communications are said to be studying the practicability of extending the Japan-Formosa service from Taihoku to Singapore.

Preliminary consideration of the proposition has pointed to the possibility of a virtual two-day service between Tokyo and Singapore. The distance from Taihoku to Hongkong is 610 miles, and from Hongkong to Singapore 1,568 miles, and it has been pointed out that the entire extension could be covered in hardly more than a day by using fast machines. The *Asahi* said that the Japan Air Transport Company had already commenced preliminary investigation, and that it had already received requests from Japanese residents in Manila that the Philippines capital be made an intermediate stopping point along the route.

Development of aerial transportation in the Far East by other countries—both impending and already accomplished—makes it highly important for Japan to extend its own air services, in the opinion of both commercial aviation circles and official quarters, the *Asahi* continued. It pointed out that the French have extended an air line to French Indo-China; that both European and American interests were active in assisting development of air lines in China, and that operation of a Trans-Pacific air service was almost at hand. Meantime, the *Asahi* pointed out, the air line to Manchuokuo is the only one connecting Japan and a foreign country.

Soba Sent by Air

The one-day service between Tokyo and Hsinking was inaugurated without mishap or other incident. The first plane

from Tokyo left early in the morning, without passengers, and connected with a craft that reached Hsinking at 7.10 that evening, Hsinking time. In addition to mail, the outward plane carried a consignment of soba—the succulent buckwheat noodles—prepared in Tokyo, which was delivered to headquarters of the Kwantung Army that night.

The plane which left Hsinking in the morning reached Osaka at 5.10 in the afternoon, its passengers being a woman and her 5-year-old daughter. It landed at the Haneda airport here at 7.50 in the evening. To Tokyo the plane brought four river fish, still alive, which were a gift from the vice-president of the Manchuokuo Air Transport Company to the War Office in Tokyo. In the mail which the craft carried were messages of congratulation from the Manchuokuo Premier to Premier Okada and Baron Kiichiro Hiranuma, Vice-President of the Privy Council; from General Jiro Minami, Ambassador at Hsinking and commander of the Kwantung Army, to Premier Okada, War Minister General Senjuro Hayashi and Communications Minister Takejiro Tokonami; and from the Mayor of Hsinking to Mayor Torataro Ushizuka of Tokyo.

Machinery Orders for China

Following the annual meeting of the Chinese Government Purchasing Commission, which was held at the Chinese Legation at 49, Portland-place, London, W.1, on Monday, February 25, the announcement was made that the sum of £200,000 is to be spent on machine tools and workshop equipment for China, which will be ordered from British firms. The equipment is, for the Ministry of Industry's National Shops at Shanghai, and for the railway shops of the Canton-Hankow Railway. As the actual orders have, however, still to be placed, no further information is yet available. The meeting was presided over by His Excellency the Chinese Minister, and among those who attended were Sir Arthur Balfour, Sir Basil Blackett, Sir Ralph Wedgwood, and Dr. C. C. Wang. The report for 1934 showed a large increase of orders placed in Great Britain compared with 1933; and the total value of the 1934 contracts was given as £1,849,979, which brought the total orders placed by the Commission since it began its work to £2,915,025. The weight of materials shipped to China last year exceeded 89,430 tons.

Railway to Sinkiang Proposed

A railway connecting Sinkiang with China Proper looms as a definite possibility as a result of the recent expedition into Central Asia, headed by Dr. Sven Hedin, the noted Swedish explorer.

A proposal for the building of such a railway has been submitted to the Chinese Government, which is carefully considering the plans, and it is reported to-day that the authorities are favorable towards the project.

It is stated that the Government is in favor of commencing work on the proposed line as soon as possible in order to complete it within five years.

In submitting the scheme to the Government, the expedition says that the construction of a railway connecting Sinkiang with China Proper is the most effective way of solving Sinkiang's problems, especially those relating to China.

Speaking on the subject Mr. Irving C. Yew, a Chinese engineer who accompanied Dr. Hedin to Sinkiang, confirmed the report that Soviet Russia had no intention of sovietizing Sinkiang, although that country completely dominated Sinkiang's trade relations with the outside world.

Soviet goods imported into Sinkiang, Mr. Yew said, were classified as "necessities" and were exempted from duties, while Chinese imports were classified as "luxuries" and forced to pay no less than 65 per cent import tax.

Soviet influences in Sinkiang, however, were on the decline, the speaker added. Nearly all Soviet advisers engaged by the Sinkiang Government had been dismissed, while the loan of 250,000 gold roubles had been reduced to 50,000 gold roubles.

In addition, he said, General Shen Shih-tsai, the undisputed leader in Sinkiang, was loyal to Nanking.

Engineering Notes

RAILWAYS

COLD STORAGE.—Negotiations for a loan of \$2,500,000 from a Shanghai banking group for institution of the cold storage system along the various Government railways are reported to be under way. According to the plans of the Nanking Ministry of Railways, cold storage plants will first be built for the four railways: Nanking-Shanghai, Shanghai-Hangchow-Ningpo, Tientsin-Pukow and Peking-Mukden lines. The project will be extended to other railways later.

LINE OPENED.—Train service on the Nanking-Wuhu section of the Nanking-Shaoan (Kiangnan) Railway was initiated on April 21, when a train of eight coaches arrived at Nanking at 11 a.m. from Wuhu, covering the distance in four hours. The train returned to Wuhu at 4.20 p.m. It is understood that the services on the section will be increased. Through transportation service with the Tientsin-Pukow and Nanking-Shanghai Railways will be inaugurated in three months.

LUNGHAI RAILWAY.—The Lunghai Railway in Shensi is now open to Weinan. The line should reach the Western capital by the end of the year and a great space outside the North Wall is levelled for the new station. It is said that the line is to be made to Hsienyang, where the important ferry across the Wei River now is, that a bridge is to be built across the river and that that will be the terminus for the Great West Road. It is reported, too, that the railway will be extended first to the Han Valley *en route* for Szechuen.

CHEKIANG-KIANGSI RAILWAY.—The Chekiang-Kiangsi Railway Administration is planning to extend the line to Foochow, provincial capital of Fukien, from Shangjiao, in eastern Kiangsi, in order to facilitate communications and transportation in south-eastern Chekiang. Negotiations are being conducted with the Fukien Provincial Government. When arrangements are completed, an engineering corps will be dispatched to make surveys on the proposed route.

S.M.R. ENTERPRISES.—South Manchuria Railway will appropriate Y.200,000,000 for new enterprises in this fiscal year. This is the largest sum set aside in any one year. Y.47,000,000 is for ordinary enterprise expenses, Y.145,000,000 for special enterprises, including railroad construction on contract for Manchuokuo and improvement of Manchuokuoan railways under the tentative management of the company, and Y.8,600,000 for investment in the Manchuria Chemical Industry Co. These funds are expected to be raised by means of debentures, calling in of unpaid shares, and by undivided profit to the amount of Y.54,000,000.

FASTER TRAINS FOR JAPAN.—The twenty-nine heavy-duty steam locomotives formerly used for haulage over the Hakone range, being no longer needed for this purpose, because of the use of electric locomotives through the new Tanna Tunnel, the railway authorities intend to transfer them to speed up trains on the Nagano-Naoetsu section of the Shinetsu line by from 10 to 15 per cent. Plans have also been made to improve several other lines in the vicinity of Tokyo. After tracks are improved and bridges strengthened, streamline locomotives will be used on express trains between Osaka and Aomori, reducing the time from the present 21 hours to about 12 hours.

SIBERIAN RAILWAY PLANS.—Extensive plans for construction of a new East-West railway system have been announced in Moscow. M. Andrew Andreyev, Commissar of Railways, also announced that all sections of the Trans-Siberian Railway will be double-tracked as quickly as possible. Further, it was stated that a network of branch lines in the territory north of Manchuokuo will be built for the triple purpose of serving as feeders to the main line, to aid in the general industrialization of the country, and to provide a second line of transportation in the event of the present eastern sections of the Trans-Siberian line becoming disabled.

NEW SHANSI RAILWAYS.—The extension of the Chengtai Railway from Yutze to Taiku is being rapidly pushed to completion. Bridging the Wu Ma River is now the main obstacle to the completion of the line. It is reported that passenger service will start January 1. The Tung-pu Railway in Shansi has been running between Taiyuan and Chieh Hsiu, a distance of over eighty miles, since July 1 last. Eventually the railway will extend from Tatung in the north to the extreme south-western corner of the province, across the Yellow River from Tungkuan. The trains travel only about ten miles per hour, due to the fact that the track is not yet ballasted. But, even so, they have already proved quite a blessing.

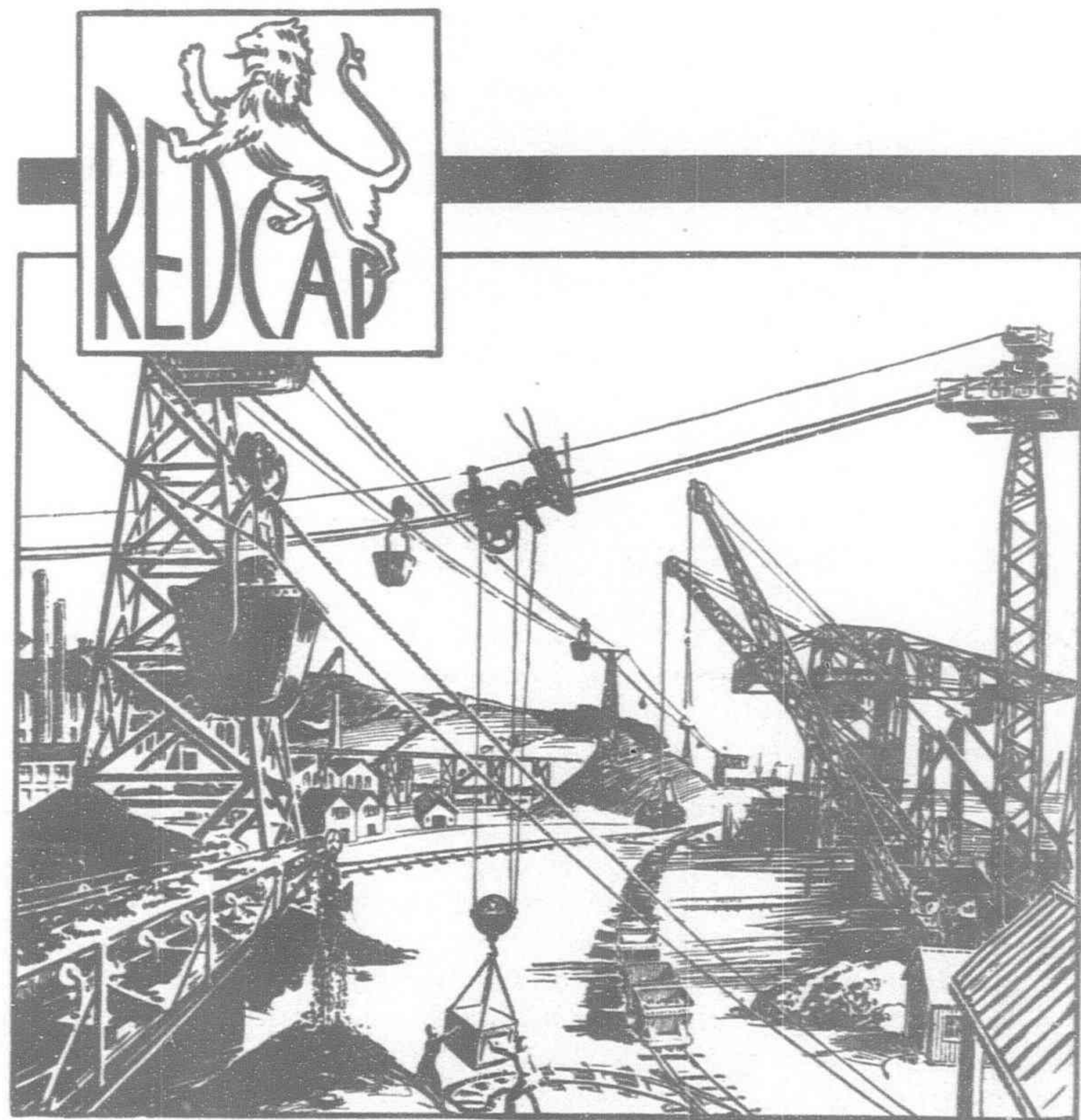
COMMUNICATIONS

NEW RADIO STATION.—The Eurasia Aviation Corporation is arranging to erect a radio station at Shanchow, on the southern bank of the Yellow River, near the Honan-Shensi border, in order to report meteorological conditions for its air-lines to the north-west.

RADIO TELEPHONE.—The Manchuria Telegraph and Telephone Company is making plans to inaugurate a radio telephone service with the United States. It is hoped to use the Hsinking Wireless Station as the central sending plant and to relay to America through Japan.

STATION FOR SINGAPORE.—The British wireless industry, says a Singapore station, is expected to make considerable gains in the Far East as the result of a broadcasting station to be built there. Two British Companies—the General Electric Co., Ltd., and Standard Telephones and Cables, Ltd.—it is learned in Singapore, are to establish this station with municipal aid.

LONG-DISTANCE TELEPHONE.—Installation work on the section of the projected Chinkiang-Tsingkiangpu long-distance telephone service between Yangchow and Kaoyu was completed on April 28. The entire line was finished by the middle of May, it is announced at the Kiangsu Provincial Department of Reconstruction. In order that the long-distance telephone network for northern Kiangsu may be ready at an early date, work on the telephone lines linking up the districts of Huaiyin, Haichow, Huaian and Yencheng is also being expedited.



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HIGHWAY OPENED.—Work on the construction of the Tangshan-Fengjen Highway in the Luantung Area by the units of the Peace Preservation Corps under General Chao Lai having been completed, the new highway has been opened to traffic. The highway is 50 li in distance and 22 feet in width with dirt surface. The cost of construction of the road is \$5,000 of which \$2,000 were appropriated by the Hopei Provincial Government, while the remaining sum was raised locally.

STEEL BRIDGE AT NINGPO.—A modern steel bridge is under construction, to take the place of the Old Bridge of Boats at Ningpo. It will be remembered that Ningpo is situated at the junction of two rivers. The city itself is connected by the New Bridge of Boats which crosses over the Yuyao River to the settlement on the west, and with the east suburb by the Old Bridge of Boats, which crosses the Fenhwa branch of the river. It is the Old Bridge which is now to be replaced, and the work, which started six months ago, is in the hands of a foreign firm.

WIRELESS PHONES FOR CHINA.—Plans for a domestic wireless telephone service as well as one with foreign countries are in hand in China. Part of the machinery and equipment ordered from England, totalling over 80 cases, recently arrived in Shanghai and was transported to Chenju for installation at the International Radio Station. The rest of the consignment was due by the end of the year. A service first will be installed to link up the more important cities, such as Shanghai, Nanking, Hankow, Tientsin and Peking, and it will be extended to other countries in March.

CHINA'S COMMUNICATIONS.—The Chinese Ministry of Communications has wasted no time in commencing negotiations with the International Settlement of Shanghai with a view to connecting China's long-distance telephone links with the biggest port in China. The telephone interests in the city are reported to be in favor of the proposal.

Several ambitious projects, which the Ministry expects to realize this year, have been outlined by Dr. Chu Chia-hua. Among these, the Minister made particular mention of the following:—Direct wireless communication with India, Australia, and Canada; radio telephone service both within China and with foreign countries; completion of a telephone service linking up nine provinces. The Ministry had purchased a number of 3½ kilowatt transmitting sets, which would be installed in Tientsin and Tsingtao, enabling these places to send radiograms to Japan, the Philippines and Annam. Successful tests of radio telephone communication with Europe and America had been made, and, with the arrival of further machinery from abroad, arrangements in this connection might be completed this summer. The Ministry proposed to erect radio telephone stations in Shanghai, Canton, Tientsin and Hankow, with Shanghai as the central point.

INDUSTRIAL

MACHINERY FOR CHINA.—The Nanking Government has granted approval to the project of the Canton authorities to buy £3,000,000 of machinery on credit from British and American firms for the erection of an iron and steel plant here. British firms mentioned in connection with this are Dorman, Long & Co., Ltd., Fraser and Chalmers, of Erith, and H. A. Brassert & Co., of London.—*Exchange Telegraph.*

SHANGHAI WATER SUPPLY.—Following protracted negotiations between the Shanghai Waterworks Company and the Bureau of Public Utilities, prospects now are bright for a water supply for the extra-Settlement, Western District. Mr. Hsu, Commissioner, states that an early conclusion of a draft agreement, already drawn up, is expected. It has now been agreed upon that a Sino-British waterworks company for the Western District shall be formed, with an initial capital of \$3,000,000, the City Government of Shanghai to grant a franchise.

MANCHUOKUO BANK BUILDING.—The Obayashi Gumi, building contractors of Osaka, has entered into a contract with the Manchuokuo Government for construction of the Central Bank of Manchuokuo for Y.6,000,000.

WATERWORKS FOR CHANGSHA.—The Hunan Provincial Government has decided to build a waterworks in Changsha, the provincial capital in accordance with plans and estimates made by the Provincial Department of Reconstruction.

KEDAH BUILDING PLANS.—An ambitious building program is proposed by the Kedah Government. The authorities plan construction of a sanatorium at Cameron Highlands and of a new Kedah House in Penang. Other public works include new Government offices at Alor Star.

SUGAR BEET WORKS.—Oji Paper Manufacturing Company has decided to start a sugar beet plantation and refinery in Saghalien, in co-operation with the Meiji Sugar Company. A new company is to be formed with either Y.3,000,000 or Y.5,000,000 capital. The project is reported to be an unpleasant surprise to the Japan Sugar Association, which has been trying to prevent an increase in the production of sugar in Japan.

MOTOR SPIRIT FROM CHINESE COAL.—A large-scale project to produce motor spirit from coal is being considered by the Chinese Government, and two Chinese Government chemists, Mr. Chin We Nai and Mr. Soon Wen, have been inspecting several North of England factories in this connection. Sheffield firms are anticipating orders amounting to several hundred thousand sterling. The Chinese plan is to produce motor spirit from coal by the low-temperature carbonization process, and much depends on the suitability of Chinese coal for the purpose. Specimens have been tested at Doncaster, and the first report is believed to be satisfactory.

SULZER BROTHERS

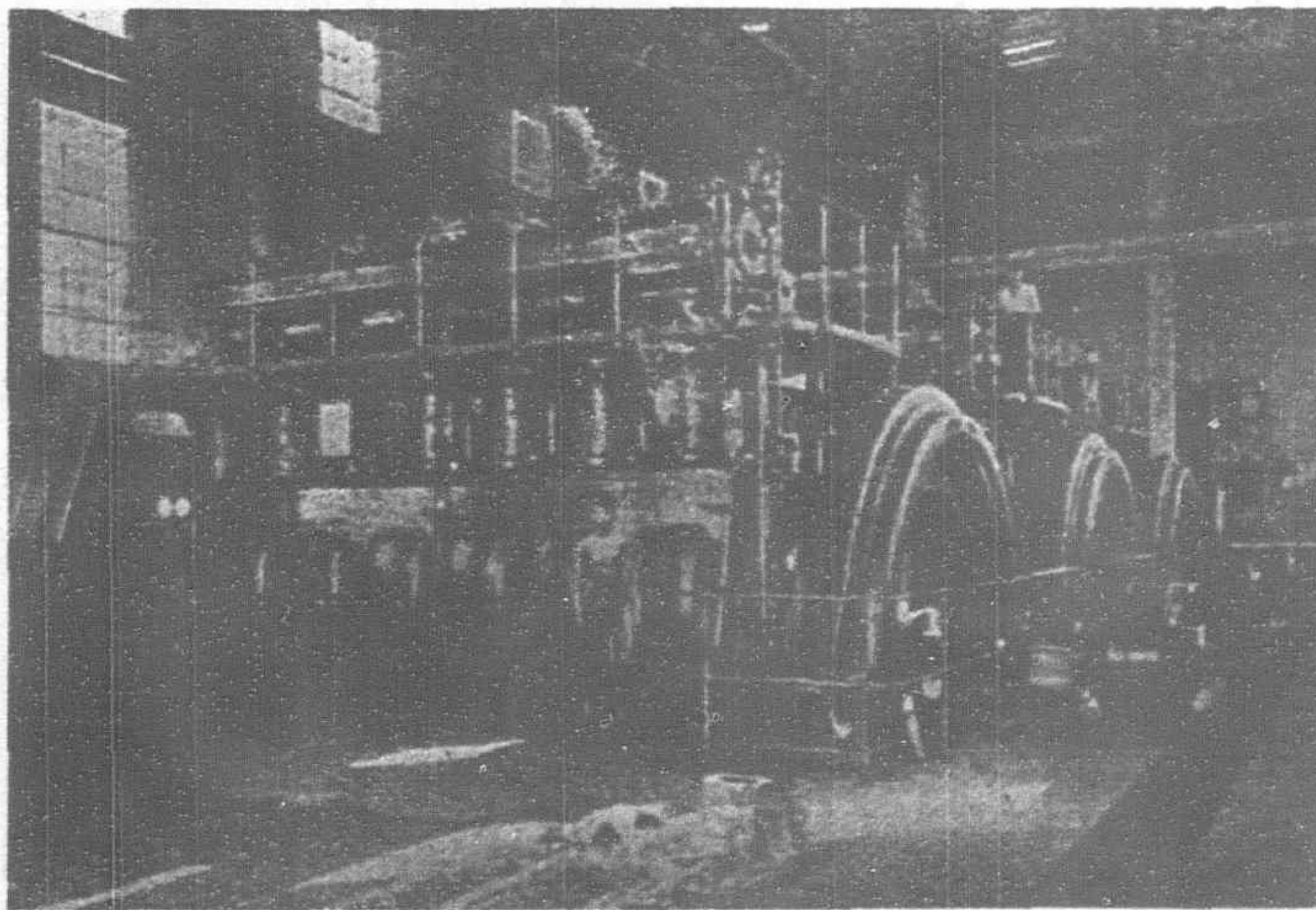
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